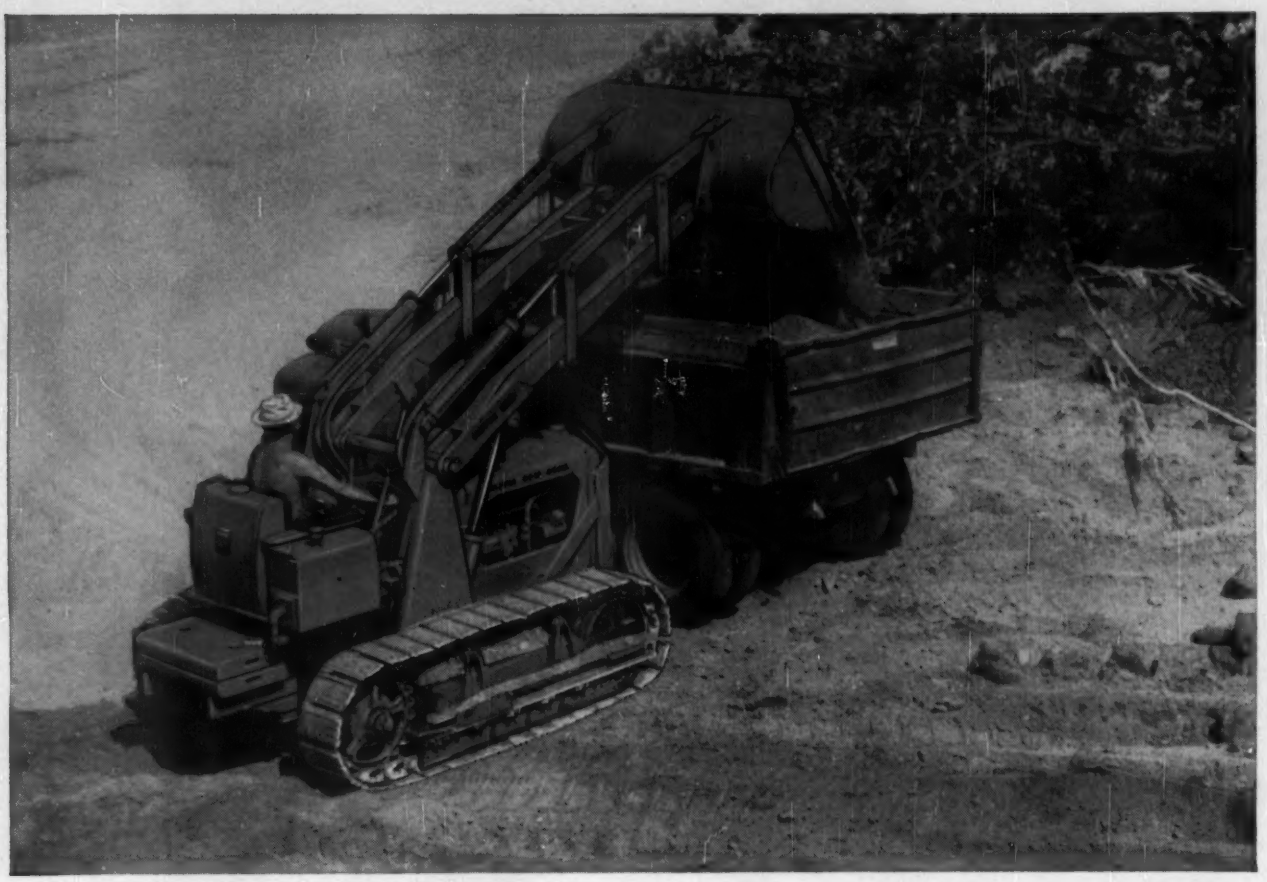
ENGINEERING NEWS-RECORD

Merry Christmas see page 14

E B POWER GS N
UNIVERSITY MICROFILMS IN
313 N 1 ST
ANN ARBOR MICH

A McGRAW-HILL PUBLICATION



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OLIVER OC-12 with 53 d.b.h.p.

53 d.b.h.p. really pays off behind this rugged dozer blade. Its front-mounted cylinders and pump provide extremely accurate control with powerful down pressure for hard, heavy soils. Angle blade also available.

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A safe, simple-to-operate crawler, the OC-12 has wide, comfortable platform, finger-tip controls, and easy steering with two-track power.

OC-12 attachments outperform the rest, too. This loader, for example, has a bucket with more rollback. It fills faster, levels at any height to carry bigger loads with less spilling. It's a balanced unit with stability . . . clearance . . . long reach...10′4″ (124″) lift. Regular bucket is 1¼-yd. size. Two and one-quarter yd. available for light materials. See your Oliver Distributor for complete information. Let him show you the OC-12 in action.

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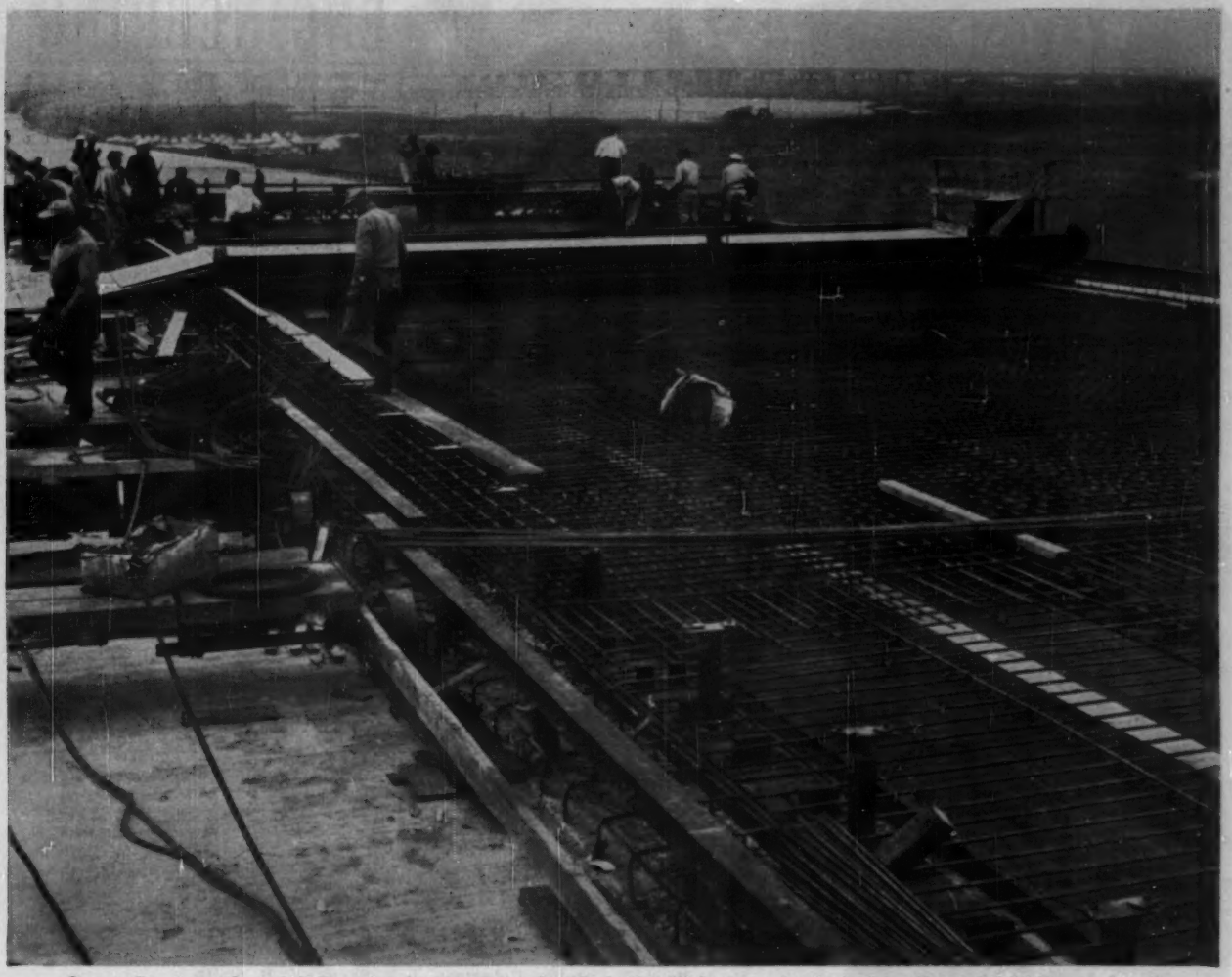

Cayuga Foundation Corp., N.Y.C., paving the west approach to the bridge. With approaches the bridge will contain 25,000 tons of steel. Bethlehem's Fabricated Steel Division erected the superstructure.

Newark Bay Bridge is Expressway Linking N. J. Turnpike and Holland Tube

The $40 million Newark Bay Bridge, now under construction, is the newest link between New York City and the Newark area. The New Jersey Turnpike Authority project is part of eight miles of expressway which will connect the Holland Tunnel with the turnpike at the Newark Airport interchange.

With approaches, the six-lane bridge is 9,500 ft long, stretching from the abutment on the east end to the beam spans of the connecting viaduct on the west. The bridge span will have a vertical clearance of 135 ft above the water at the channel, permitting the passage of large vessels into upper Newark bay.

Two 36-ft roadways separated by a 4-ft center mall will cross the bridge. Shown here is the paving operation on the west approach, for which Bethlehem supplied a substantial tonnage of reinforcing bars.

Bethlehem bars, used on so many important concreting jobs, are made exclusively from new-billet steel of known analysis. They come in size ranges from Numbers 3 to 11, with deformations meeting ASTM Spec. A-305. They are cut to length and bent in our shops, and reach the job bundled and tagged, with bar lists included, ready for instant placing.

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Robert F. Boger
Publisher

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B.F.Goodrich

All-Nylon All-Purpose tires roll 55,000 miles for building materials company

HIGHWAY, shopping center, housing development, industrial plant — all types of construction use concrete and a host of other materials from Hilltop Building Materials, Inc., of Cincinnati. 100 ready-mix trucks, 20 dump trucks and 6 flat bed trucks range over southwest Ohio highways, on rock and rut-choked roads, as often on no roads at all.

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Specify B. F. Goodrich tires when ordering new equipment.

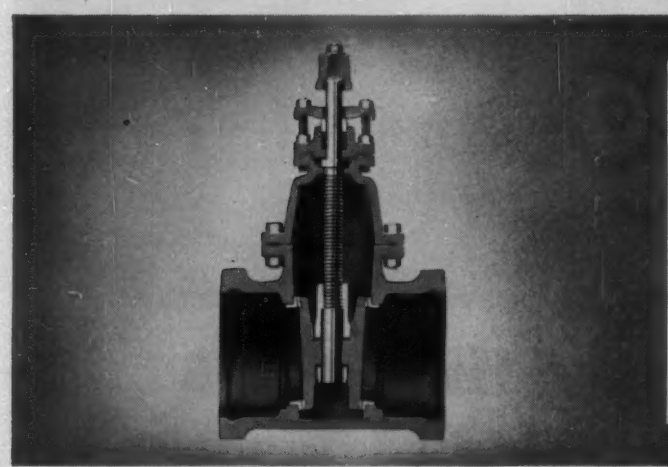
"ALL-PURPOSE TIRES give excellent traction and clean very well," says Hilltop Fleet Superintendent Edgar Pitzer.

A 20-TON LOAD of concrete at a construction site. Hilltop gets a longer run-per-dollar from all-nylon tires.

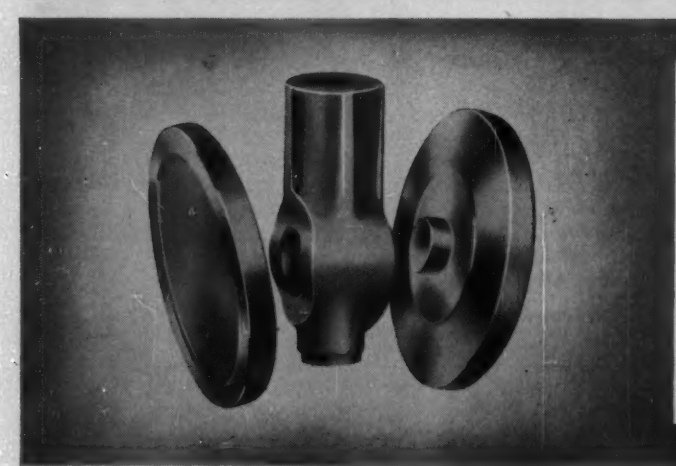
RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

R. D. WOOD GATE VALVES PROVIDE POSITIVE FLOW CONTROL AFTER YEARS IN THE LINES

Here's what the R. D. Wood Gate Valve looks like from the outside — rugged, simple, streamlined. It is built for generations of dependable service in the lines. Available with all pipe connections, including mechanical joint.



Strip it down to a sectional view and you can see why interruptions in service are rare. There's virtually nothing to go wrong — none of the complicated small parts that fail in an emergency because sediment and scale render them inoperable.



Bring the R. D. Wood Gate Valve down to its essentials and you have the spreader and two discs. Rising or descending, discs are free to revolve completely, thus distributing wear evenly. In closing, discs are fully lowered before spreading action begins. Fully opened, components move out of the water way, providing full pipe capacity.

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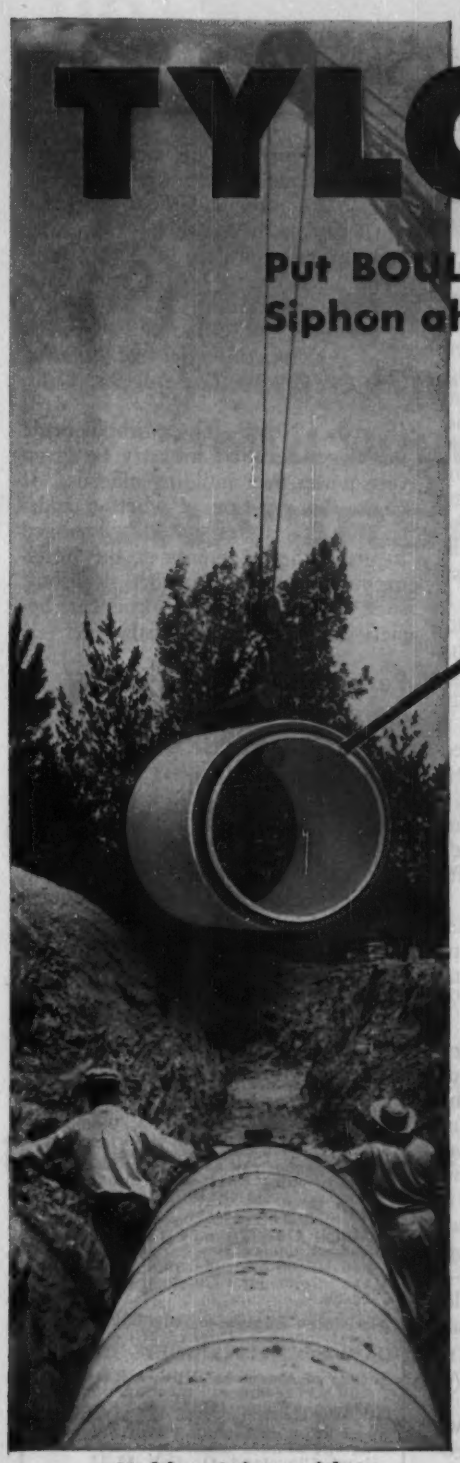
Put BOULDER, COLORADO'S* new Irrigation Siphon ahead on 3 Major Counts . . .



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* **PROJECT** — Ninth Avenue Irrigation Siphon, Farmer's Ditch Company, Boulder, Colorado.

PIPE — 48" reinforced concrete, manufactured by Western Concrete Pipe Company, Denver, Colorado.

ENGINEERS — Engineers of Soil Conservation Service, Boulder, Colorado.

CONTRACTOR — Hudson Construction Company, Boulder, Colorado.

FEATURE — Inverted Siphon, Maximum head, 44 ft.

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Reader Comment

An Answer to Who Owns Code

SIR—You ask: "Who Owns a Model Code?" (ENR Oct. 27, p. 24). If you refer to the Uniform Building Code, the answer is: The Pacific Coast Building Officials Conference.

Do you actually mean to say that industry should be given veto power? The Uniform Building Code belongs to the building officials, and its success is evidenced by the large number of jurisdictions that have adopted it. This success would never have come had industry been given a controlling vote. Your "democratic procedures" are available when the local legislative body adopts the code with whatever revisions it sees fit to make.

An industry representative is not qualified to draft a building code for two reasons. In the first place, he does not have the working knowledge of enforcement problems that is needed to get a workable code. Second, his sole aim as an industry representative is to increase profits for his group. This motive is perfectly good and ethical—no one questions that—but it disqualifies him for drafting a model code.

We might suggest that industry is free to draft a model code at any time, but let industry take the responsibility for it and not ask for veto power over building officials.

Referring to the point to which industry objects—giving the building official the right to waive shop inspections where the work is done by an approved fabricator—this gives industry something. It takes nothing away, nor does it force anyone to apply for an approval. The manufacturer may elect to continue as in the past. But this is immaterial—the point is that the Uniform Building Code belongs to the Pacific Coast Building Officials Conference. It is their achievement, and they are responsible.

You are correct in saying that we can't succeed without industry cooperation; furthermore, cities will not adopt a model code unless it is workable. We recognize the importance of both of these facts. Otherwise you would not see the Uniform Building Code in use in 800 cities, counties and states.

GILBERT E. MORRIS
Superintendent of Building
City of Los Angeles, Calif.

[EDITOR'S NOTE—The editorial made no suggestion that industry be given veto power over building officials. It raised the question of whether code-revision procedures should be changed to give other segments of the building industry a voice in final decisions, such as is done in the American Society for Testing Materials.]

Permission Granted

SIR—This is to congratulate you on your excellent article, "Swedes Make Rock Tunnel History" (ENR Sept. 1, 1955, p. 34). As editor of the bulletins of the Swedish Water Power Association I would very much appreciate your permission to reprint your article in one of our next publications.

OLLE G. GIMSTEDT
Stockholm, Sweden

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

Letters should be addressed: Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

CALENDAR

American Road Builders' Association, annual convention, Miami Beach, Auditorium, Miami Beach, Fla., Jan. 11-14.

Highway Research Board, annual meeting, Sheraton-Park Hotel, Washington, D. C., Jan. 17-20.

American Society of Heating and Air-Conditioning Engineers, annual meeting, Sheraton-Gibson Hotel, Cincinnati, O., Jan. 23-25.

National Association of Home Builders, annual convention-exposition, Conrad Hilton and Sherman Hotels, and the Coliseum, Chicago, Ill., Jan. 22-26.

Associated Equipment Distributors, annual meeting, Conrad Hilton Hotel, Chicago, Ill., Jan. 29-Feb. 2.

Society of American Military Engineers, annual technical meeting, Palmer House, Chicago, Ill., Feb. 9-10.

Association of Asphalt Paving Technologists, annual meeting, Hotel Cleveland, Cleveland, O., Feb. 13-15.

Associated General Contractors of America, national convention, Waldorf-Astoria Hotel, New York, N. Y., Feb. 13-16.

American Concrete Institute, annual convention, Bellevue-Stratford Hotel, Philadelphia, Pa., Feb. 20-23.

American Concrete Pipe Association, annual convention, Broadmoor Hotel, Colorado Springs, Colo., March 6-10.

American Congress on Surveying and Mapping, and American Society of Photogrammetry, convention, Shoreham Hotel, Washington, D. C., March 18-24.

Conference on Urban Design, Robinson Hall and Hunt Hall, Harvard University, Cambridge, Mass., April 9-10.

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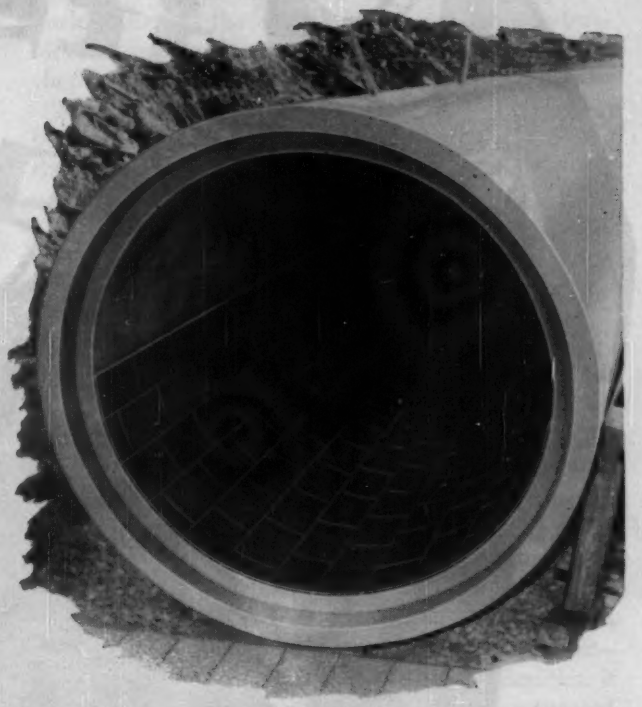

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PROJECT: Ashburton Filtration Plant.

ENGINEERS: J. H. Strohmeyer, Engineer, Water Department of the City of Baltimore, and Whitman, Requardt & Associates, Consulting Engineers.

CONTRACTORS: Arundel Corporation, Baltimore, Md.

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THE CONSTRUCTION WEEK

NUCLEAR ENGINEERING—One of the biggest drawbacks to a nuclear power industry, as the Nuclear Engineering and Science Congress made clear last week (page 13), is that "there ain't no such animal"—yet. All but a few of the many types of nuclear reactors that appear to be economically feasible exist only on paper—and the same holds true for chemical plants for reprocessing spent fuel.

Reactor components at present must be custom built, pending construction of plants for fabricating them. So nobody could say with certainty what nuclear power actually will cost until the power plants and supporting facilities are built and operated.

But this much is sure: Growth of the nuclear power industry will create a demand for considerable construction, much of which will involve new concepts that will require designers and builders to add to their staffs specialists in the new field.

TALES OF TWO TURNPIKES—Two toll roads made news last week. The one—an extension of the eight-year-old Maine Turnpike—opened with suitable fanfare (see p. 22). On it will be found many of the safety features that traffic engineers have developed over the years. Included are wide paved shoulders, ramped entrances and exits, depressed medians, etc. The other—the proposed second Ohio Turnpike—didn't do so well. Because of financing difficulties, it has been suggested that the $516 million estimated cost could be shaved by $91.5 million with certain compromises. The compromises include grade intersections, narrowing or elimination of paved shoulders, increases in grade allowances and a decrease in pavement thickness (see p. 15).

GAMBLER'S GAMBIT—Board of Education officials of Dayton, Ohio recently were faced with the problem of duplicate bids on a school project. Both the B. G. Danis Co. and Henry Stock & Son Co. had entered bids of $93,900. The bidders solved the situation, however, by offering to let a coin decide. The Stock Company got the contract; the Danis Company got the coin—silver dollar—as a consolation prize.

FIRST-HAND EXPERIENCE—For some time now Sacramento's traffic engineer, D. Jackson Faustman, has maintained that there was no need for larger signs pointing the way to Sutter Maternity Hospital. But the Traffic Engineer had to admit that when he became a prospective father, the bootie was on the other foot. After the excitement of his race with the stork, Faustman confessed that he had missed the signs and had difficulty in finding the streets leading to the hospital. The result: there will be larger directional signs installed along the route.

Looking for a TOUGHER STEEL?

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THE NEWEST IN A COMPLETE LINE OF ALLOY STEELS

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WASHINGTON OBSERVER

One of the most-watched indicators of housing starts has taken a nose-dive. This is the Veterans Administration's monthly report on requests from builders for VA appraisals of the mortgage value of houses the builder is planning to build. Builders ask for such appraisals up to six months before construction begins. Most of the appraisals turn into starts.

November requests are down 27% under those for October. Normally, there is a decline between October and November—although a year ago, the request figure actually was higher in November than October.

The shocker is the size of the decline coming at this time of year. There was a similar 25% drop between May and June of this year, but this came after four exceptionally high months. **November requests were for 39,397 units,** the lowest number since January of 1954, when builders asked for appraisals on 20,124 units.

Government housing officials say the tight money market did it. They say builders can't go ahead with as big plans under present conditions, as they might if money were in better supply. The official line is that mortgage money will be easier soon, perhaps next month.

•

Backers of the so-called "small projects" bill for irrigation works think they'll be able to agree on recommendations for a satisfactory compromise. House and Senate have each passed different bills to permit local irrigation districts to borrow federal funds for nonfederal projects, up to $5 million per project.

The law would authorize some $200 million in funds for lending—half to go to 17 western states, the balance to the other 31 states. Appropriations still have to be voted. Loans would be made by Department of Agriculture for the eastern states, Department of Interior for the West.

•

Government's stepped-up program on air pollution is getting underway. The Bureau of Mines is looking into several aspects of the problem with funds made available from Public Health Service appropriations.

Improved design and operation of incinerators used by cities and industrial plants is to be investigated at Pittsburgh. At Bartlesville, Okla., the bureau will work on reducing or eliminating contaminants now produced by internal combustion engines.

Four agencies will begin work on industrial air pollution at Louisville, Ky., next month. These are Weather Bureau and Bureau of Standards, besides Bureau of Mines and Public Health Service.

•

First government-sponsored review of airport design to cope with jets is being held in Washington Jan. 11.

Airports should be ready to handle jets by the end of 1958 according to estimates of delivery of jets to the airlines. There's no airport that's really ready for them.

The asphalt vs concrete squabble will get another airing. Already, the military have been through a hassle on this. Air Force field commanders have long preferred concrete—but Congress, forced the Air Force to change their price differential favoring concrete design, giving asphalt a better break to get military business. Civilian airports will benefit from the Air Force research and studies of asphalt's ability to resist fuel spillage and heat blasts. New surface mixtures including rubber have already been proved to the point where they're being used in new military airfield construction.

Longer runways, blast protection fences, stronger and heavier taxiways and ramps are among other problems that will have to be decided.

Aluminum grating now only slightly higher than conventional steel gratings

Borden, through many years of plant production control, can now produce aluminum floor gratings by the same commercial methods used for ordinary steel gratings. Thus the ultimate in-place cost is only slightly higher than that of conventional gratings.

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The Challenge of Atomic Construction

Nearly all the unclassified information comprising the new field of nuclear engineering poured out last week like flood waters through a broken dam. It portended a swelling stream of new construction.

The breakthrough came at the Nuclear Engineering and Science Congress in Cleveland, Ohio, sponsored by 26 engineering and scientific societies and coordinated by Engineers Joint Council.

The deluge, in the form of more than 250 papers and 150 exhibits, attracted about 8,000 paying spectators, of which probably 3,000 were members of the various sponsoring organizations.

Papers covered a wide range of subjects—safety and site selection for reactors, reactor technology, radiation damage to structural materials, radio isotopes and tracer techniques, radiation effects on chemical reactions, legal and insurance problems, uranium geology, disposal of radioactive wastes, recovery of fission products and handling processing and rejuvenation of fissionable fuels. Reprints of the papers presented are available from the American Institute of Chemical Engineers, 25 W. 45 St., New York, N. Y.

Exhibits include models of reactors, materials for nuclear equipment and many different types of instruments for measurement and control. Several large engineering and contracting firms displayed pictures and models to illustrate the experience they had already gained in nuclear engineering and offered to design and build nuclear power plants for anyone willing to pay for the service. The reactor models were particularly intriguing because they demonstrated the basic principles of operation of the many different types simply enough for even a layman to understand.

• **Construction ahead**—Few of the reactors displayed or discussed in the papers have been built. But their feasibility seems certain, and there appear to be good prospects that construction of several may be undertaken within a year.

If the topics covered by the technical papers are any indication, as nuclear power expands, there is bound to be corresponding growth of supporting industries that will require much new construction. There will be a need for research laboratories, water and waste treatment plants, fuel refining, fabrication and reprocessing plants and factories for making reactor components, instruments and handling equipment, to mention only a few.

The flood of information on nuclear engineering resulted from the release by the Atomic Energy Commission of a vast amount of data to meet requirements of the Atomic Energy Act of 1954, which opened the nuclear power field to private enterprise. Because nuclear engineering involves many different types of engineers and scientists, the 26 societies cooperated to sponsor the Congress held in Cleveland to spread the available knowledge on the record.

• **Location problem diminishing**—Three of six papers contributed by the American Society of Civil Engineers had to do with reactor site selection. One of these considered the waste-disposal problem as a factor in locating reactors, and other discussed meteorology and the possible accidental release of wastes to the atmosphere.

Isolated sites for atomic energy plants are to be a thing of the past, one author believes. As they become commercial ventures, the competitive situation will put reactors near the market for their products and services—reasonably near population centers.

A representative of duPont described that firm's method of locating sites for commercial chemical plants. He traced their systematic site-selection process as it had applied to locating AEC's Savannah River plant and showed that with some expansion their method worked well for locating the atomic facility. The same basic requirements considered in locating chemical plants apply as well to location of reactor sites: raw materials, water, wastes, transportation, labor, acreage, and power.

• **Waste problem remains**—About a dozen papers were contributed by the American Water Works Association—on removal of radioactive materials from water, on disposal of atomic wastes and on radioactivity as a factor in stream pollution.

These papers re-emphasized the importance of the waste problem, which one school of thought holds to be the factor that will govern rate of nuclear development. Many millions of gallons of waste fission products already are buried under many acres of U. S. land, at costs for underground tank storage of up to $2 per gallon. And although tank storage is consid-

Nuclear Training Is a Challenge too

The problem of developing the engineering and scientific manpower necessary to sustain U. S. atomic progress was posed by AEC Chairman Lewis W. Strauss, in these terms:

• On the basis of an estimate that the country will have over 80,000,000 kw of power from nuclear reactors within 20 years, the power field alone will require 30,000 specialists.

• A number of industries in the atomic field are providing on-the-job training for their engineers. But an AEC survey shows that over the next three years they will fill over half their atomic manpower requirements by hiring them away from someone else.

• Over the long pull, there is no other way to increase the number of atomic scientists than by incorporation of "the fundamentals of nuclear technology" in college curriculums.

In a significant first step toward this goal, Adm. Strauss revealed that a summer institute for faculty members of American engineering colleges would be inaugurated this June at the Argonne Laboratory School of Nuclear Science and Engineering. A "student body" of 60 will be selected.

Arrangements for the institute are being made by the National Science Foundation and the American Society for Engineering Education.

cred a temporary expedient, it still must be resorted to on a large scale until some better means of disposal is found.

It is estimated that if a conservative 10% of all electric energy generated in the U.S. in 2000 A.D. comes from nuclear reactors, there would be up to 500,000 gal of radioactive wastes produced daily. So the search goes on frantically for means of disposal.

Land disposal, a currently favored solution, has developed to the point where wastes are absorbed on clay, which is then backed into a practically leach-proof ceramic for burial in tight soil above groundwater. Investigators are also studying ocean disposal, storage in mines and discharge into deep geologic formations.

• **Possible power sources**—There was little agreement among the engineers as to which of the many different types of reactors had the best prospects for commercial power production. Reactors may be classified into three types in accordance with the average energy of neutrons: 1. Thermal reactors, where low-energy neutrons are required for fission and a moderator is used to slow them down. 2. Intermediate reactors. 3. Fast reactors, where high-energy neutrons are used and there is no moderator. They may be further classified with respect to the type of moderator and coolant (which is used to convert water to steam) and the type and physical state of the fuel. So many uncertainties exist in all cases, since so few reactors have been built to date, that accurate cost comparisons cannot be made at this time.

One of the more important factors affecting power costs is the necessity of removing spent "hot" fuels and reprocessing them. Some of the reactor designs, such as the homogeneous reactor types, with the fuel in liquid form, represent attempts to minimize costs resulting from this operation. Many of the papers, however, proposed methods for cutting down the expense of reprocessing solid fuels.

• **Transmutations**—Neutron bombardment and radiation may change the characteristics of the components of nuclear reactors. Several papers considered the structural damage that might result and speculated on the possibilities of materials that would reduce maintenance, such as the rare metals beryllium and zirconium and ceramic-coated metals. In addition, some papers discussed beneficial uses of radiation: prospects for improving the properties of some plastics, prevent food spoilage, speeding chemical reactions.

The Cover . . .

Merry Christmas

Christmas comes to construction in every conceivable raiment, depending on the clime of the job. Traditionally, however, it is a mantle—or more—of snow that clothes the Christmas scene, and it is one of these that we have chosen to grace our cover and this our Christmas card to every reader.

But much more than a picture of snow is shown—and intended—by this scene of a state highway department maintenance crew clearing the road over one of California's high mountain passes. Here is devotion to duty, concern for the public welfare, service to mankind—those basic characteristics of the construction calling that mold so harmoniously with the Spirit of Christmas as expressed by Peace on Earth, Good Will to Man.

Our Christmas wish for every reader is that he discern this same kinship of the physical and the spiritual in the picture of his own particular job, and exact from it the ultimate in happiness and satisfaction.

A Merry Christmas to all.

The Editors

Columbia Crossing

Design details call for alternates on pier work

Design details for the second interstate bridge across the Columbia River between Portland, Ore., and Vancouver, Wash., provide for alternates of conventional cofferdam river pier work or use of precast concrete shell for the 11 main piers. Use of precast concrete shell piers is a feature of the Richmond-San Rafael, Calif., bridge now nearing completion (ENR March 4, 1954, P. 30).

The new $12-million bridge, to parallel one built in 1915-1917 at a cost of $2 million, will be 3,500 ft long. It will be a 16-span and single verticle lift structure. The existing bridge, to be rebuilt at a cost of $2 million to conform with new bridge clearances, will handle the opposite traffic in a twin one-way pattern.

Bids on the new structure will be called Jan. 13 and awards are expected to be made before May 1. The Oregon Highway Commission will handle design and construction, while the Washington State Toll Bridge Authority will sell the revenue bond issue and collect tolls.

Design of the new bridge calls for:

- Four reinforced-concrete approach spans at the Oregon south bank.
- Seven truss spans of 265 ft.
- A 531-ft truss span that will rise at 4.7% grade from 55 ft to 80 ft above low water at the north end. This feature is designed to meet river navigators' demands for a 70-ft clearance and to reduce draw-span opening to a minimum.
- A span truss of 274 ft.
- A 278-ft vertical lift span that will rise 139 ft for a total clearance of 179 ft to accommodate ocean-going freighters in the main channel.
- A 273-ft truss span.
- A reinforced-concrete decked girder span of 50 ft at the north bank feeding into the Highway 99 Freeway through Vancouver.

Third Stage of Delaware Water System Gets Going

New York City's Board of Water Supply celebrated its 50th anniversary this Monday (Dec. 19) with a groundbreaking for construction of the third stage of its Delaware water system.

City officials traveled to the small town of Harvard, N. Y. (close to the northeast corner of Pennsylvania) to see ground broken on the 44-mi West Delaware Tunnel. This newest feeder to the 85-mi Delaware Aqueduct will tap waters of the West Branch of the Delaware to be stored behind a 175-ft high earth dam at Cannonsville, N. Y.

The tunnel work—first contract to be let on this project since the tunneling will take longest to complete—is a 20-mi portion of the 44-mi total length. How prices bid on this 1955 project compare with bids on the East Delaware Tunnel taken in 1949 is told on page 48.

Second Ohio 'Pike

Detailed restudy could make toll road possible

A study of "improvisations" is now under way which may lop $91.5 million from the construction costs of Ohio's second turnpike. If this can be done, the project could become financially feasible.

The 400-mi north-south system, linking Cincinnati with Conneaut with a spur from the Columbus area to the Toledo area, had been estimated by Baltimore consulting engineers, J. E. Greiner Co., to cost $516 million. This figure does not include costs of financing or right-of-way acquisition. Coverdale & Colpitts of New York then estimated that the revenue would be insufficient to be attractive to investment firms.

James W. Shocknessy, Chairman of the Ohio Turnpike Commission, said that the new studies will seek to use existing free roads as links between sections of all-new highway. He also proposed that some interchanges be eliminated and that T-intersections with free roads be used at interchanges with low traffic density. Steepening of grades from two to three percent where traffic density and topography warrant it is also being considered. Shocknessy also suggested that the paved 8-ft inside shoulders may be narrowed or abandoned in sections, and that cost of structures could be reduced without diminishing design standards.

Shocknessy also asked the State Highway Department to extend the Mill Creek Expressway at Cincinnati and the Lakeland Shoreway Expressway at Cleveland to effect a saving to the turnpike of $24 million.

Earlier proposals made by the turnpike chairman were estimated to save up to $67.5 million. These included incorporation into the turnpike of the improved portion of Route 40 east of Springfield and a portion of Route 42. Approval of these moves would have to come from the Highway Construction Council.

On the basis of the new studies and reports on concession returns from the first Ohio turnpike, Coverdale & Colpitts will be requested to make new traffic surveys and revenue estimates.

Hangar Will Be Tilted on Edge to Hold Bigger Planes

An unusual project that will enlarge an existing 125x320-ft hangar will get under way next month at Newark Airport, N. J. Additional vertical clearance (required by new DC-6 and DC-7 aircraft) will be provided by tilting the arch-shaped hangar about one of its long edges.

The existing building is arched in the 125-ft direction by 3-hinged steel arches. Aluminum corrugated panels comprise the exterior. Height at the center is now 28 ft—will be 36 ft after tilting.

The plan consists of disconnecting the tie rods under the floor that carry the thrust of the arches. These will be replaced by temporary cables. Then the building will be jacked up 16 ft along one edge and a leanto structure will be built under it, running the length of the hangar.

The new addition is designed to open into the hangar. It will house the maintenance shops, offices, lounge and other facilities.

Estimated to cost between $350,000 and $400,000, the project is now out for bids which will be opened on Dec. 28th.

Newark Air Service, Inc. operates the hangar. The work is being planned by Engineers Co., Inc., of Newark.

Ten-Year Comparison Shows Fluoridation Cuts Decay 58%

The final results of a 10-year experiment indicate that fluoridation of drinking water is effective in preventing tooth decay in children. Begun in 1945 with the cooperation of Newburgh and Kingston, N. Y., the comparative test showed that there was 58% less decay among Newburgh children, who drank fluoridated water, than among Kingston children, whose supply was fluoride deficient.

New York State Health Commissioner Herman E. Hilleboe, in announcing completion of the program, reported that water with one ppm of fluorine is also safe. Periodic physical examination showed no difference between children of both cities in growth, bone structure, blood, urine, vision or hearing.

Dr. Hilleboe anticipated the successful outcome of the study as early as five years ago (ENR April 5, 1951, p. 29), but the records at that time showed only 33% fewer dental defects among Newburgh children.

On the basis of the successful conclusion of the study, the Welfare and Health Council of New York City has issued a statement that it will call for fluoridation of the city's water supply.

Highway Needs Set

Michigan 20-year plan will require $5.7 million

Michigan must spend $4.5 billion for improvements to its major highway systems—state trunklines, county primary roads and major city streets—during the next 20 years if those highways are to be made adequate for the traffic volume now anticipated by 1975.

In addition, $1.2 billion must be spent on local county roads and local city streets, thus bringing the total cost of improvements to $5.7 billion. Maintenance and administration costs are not included in these figures, which are based upon the price levels for 1954.

By 1975, motor-vehicle registrations are expected to be 62% above the current figure of 2,816,000, and motor-vehicle travel will increase by 78% over the 1955 figure of 27,000,000,000 vehicle-miles.

These are the findings of a new engineering survey of Michigan's highway needs made by the Automotive Safety Foundation to supplement a similar study made in 1947. Since 1947 there has been little change in the relative proportions of work required for the several road and street systems, but the total cost is 3.5 times greater now than in 1947. This is due to the large increase in motor-vehicle use, to the higher standards now set, and to the rise in construction costs.

• **Alternative programs**—Three alternative programs for annual expenditures to cover improvement work, maintenance and operation are set up in the ASF report. One calls for an average annual expenditure of $378 million for 20 years, a second calls for $434 million in each of 15 years and a third calls for spending $515 million annually for 10 years to get the bulk of the work completed in that time, to be followed by expenditure of $240 million in the remaining 10 years of a 20-year period. This is considered the preferable plan but calls for much higher initial expenditures.

Total receipts from all sources applicable to highway work are estimated for 1956 at $260 million, not including borrowings. Consequently, if the plan to spend $378 million a year for 20 years is adopted, an average of $65 to $70 million additional will have to be found annually during that period, making allowance for growth in motor-vehicle registration and travel. Proposed increases in federal aid might reduce these amounts considerably, according to the ASF findings. This is due to the fact that $3.3 billion of the proposed work is on the federal-aid systems.

• **Trunkline needs**—Rural trunkline needs are set at 2,471 miles on new locations, including 911 miles of controlled-access expressways. Also required are 5,772 miles of reconstruction on existing alignment.

Urban trunkline improvements consist of 161 miles of expressway construction of which 143 miles will be in the Detroit region. Also required are 44 miles of arterials on new locations and 721 miles of reconstruction.

Noteworthy in the program for rural county primary needs is 753 miles of multi-lane highways, of which 32 miles are six-lane. This work is chiefly in the metropolitan counties.

A separate report on means for financing this program is being prepared by Richard M. Zettel of the Institute of Transportation and Traffic Engineering at the University of California.

Turnpike Timetable

Florida sets a schedule for toll road extension

A tentative timetable has been worked out for the $200-million Florida Turnpike extension that will run 214 mi from Ft. Pierce to the northern part of the state.

Plans made by the Florida State Turnpike Authority call for the feasibility report to be issued about Jan. 9. Immediately following this, proceedings for validation of the bonds will be started and a target date set for their sale. Construction is scheduled to get under way next spring.

The extension will run from the northern terminus of the Hollywood-Ft. Pierce bob-tailed turnpike to a point near Jacksonville still to be determined by the engineers' report.

The Jacksonville terminus has been a bone of contention. Jacksonville business interests have been up in arms against route plans that would by-pass the city (ENR Sept. 29, p. 76). Originally, the route was slated to run 16 mi to the west of Jacksonville, but it was brought in 10 mi as a result of local protests. The northern terminus as finally suggested by Howard, Needles, Tammen & Bergendoff, New York City consulting engineers, would link about 6½ mi west of Jacksonville and furnish feeder lines into the city.

In a report issued last February engineers estimated the cost of the turnpike extension at $207 million. But in view of the $10-million savings that have been made on the 110-mi bob-tailed section it may cost less.

Who Really Pays?

Tight schedules and high penalties up bid prices

A California AGC official has protested new policies of the California Division of Highways that impose tighter time schedules and higher penalties for failure to complete work on time.

At a press conference in San Francisco Gordon Pollock, president-elect of the Northern California Chapter of AGC stated that such policies have already resulted in higher bids. Pollock who heads the Sacramento construction firm Geo. Pollock Co. urged more realistic time schedules and more realistic penalties.

Pollock said that contractors holding contracts under the new policy are sitting ducks for labor beefs. With high penalties facing them, the contractors would have no choice but to accede to special labor demands. And these concessions, he warned, might set patterns for the entire construction industry.

California's state highway engineer, George T. McCoy, announced last July that assessments for overrun of time limits would include an evaluation of additional costs to the motor vehicle user. Such evaluation would be in addition to direct cost to the highway department including costs arising from engineering and inspection.

According to McCoy, the increasing volume of traffic has made it imperative to complete as rapidly as possible safer, less congested modern facilities. And McCoy warned that impending increased programs would make this an even more important factor in this matter.

Most California highway contracts have been finished on schedule. But a few have been delayed resulting in increased costs to highway users in terms of congestion, detours and accident hazards.

Amount of penalty varies with the location and nature of the construction job. Some are the same or only slightly greater than under the old system. Others are much greater. For instance, on an important link of the Bayshore Freeway recently awarded to Guy F. Atkinson Co., for $2,039,000 the penalty is assessed at $9,000 a calendar day.

The time limits are extended for days lost due to bad weather, labor troubles and the like. But Pollock complained that evaluating poor weather conditions was too much responsibility to place on resident engineers in view of the increased penalties.

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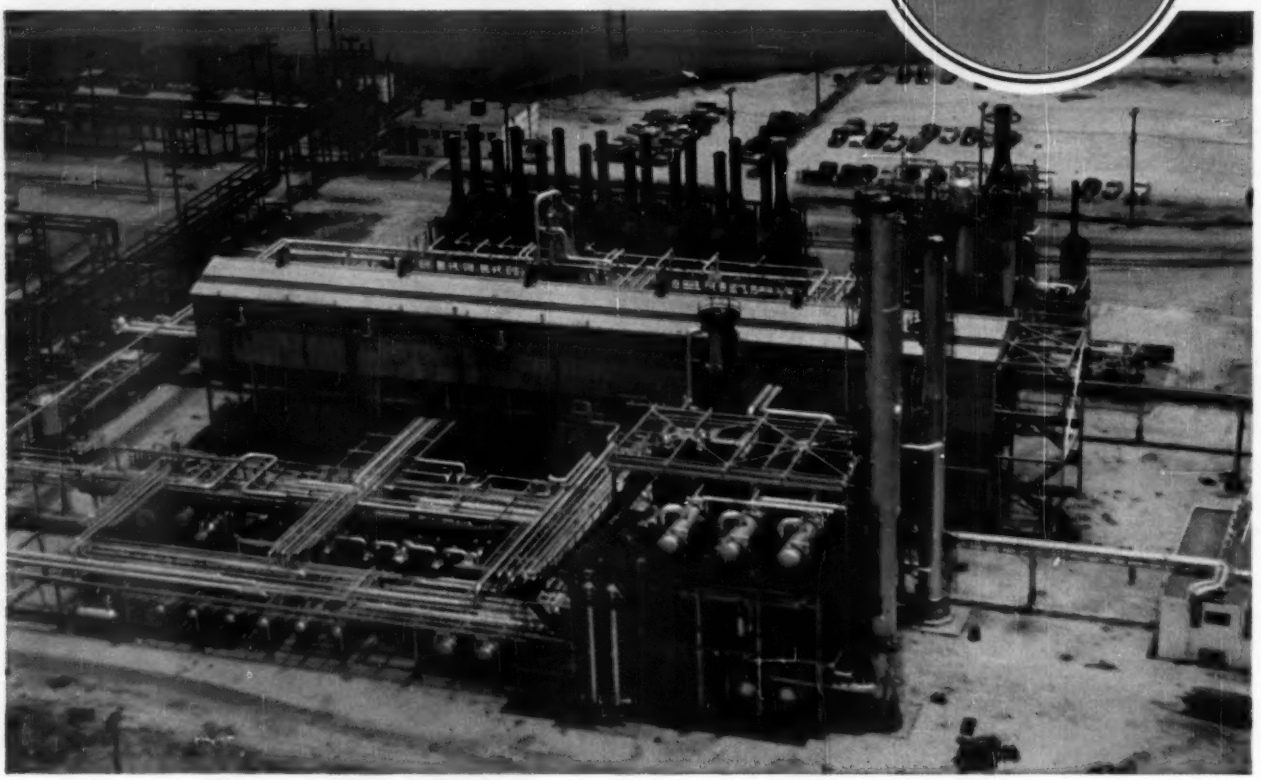

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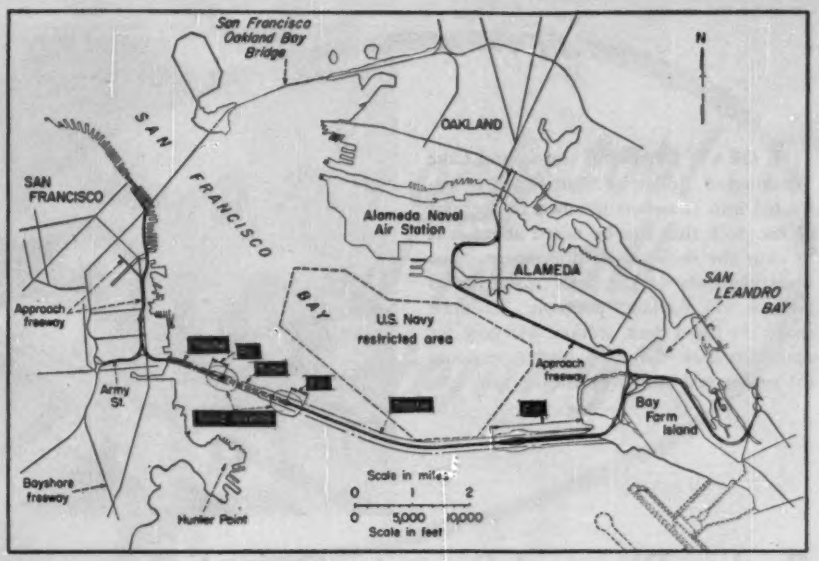


Proposed Alameda-Army St. crossing of San Francisco Bay would be composed mainly of trestle, but tube section between the sand islands would cost more than three times as much as all trestle sections. Tube is required to provide a ship channel.

Study Okays New San Francisco Bridge

Construction of a southern crossing of San Francisco Bay could be under way by the middle of 1956. A report culminating two years of feasibility studies by the California Department of Public Works was presented last week to the California Toll Bridge Authority. The studies find the crossing, whose location was spelled out by legislative action in 1953, to be feasible both from an engineering and a financial standpoint. Construction cost for the 7½-mi mole fill, trestle and subaqueous tube bay crossing, together with its 17-mi approach system, is tabbed at $249.2 million. Of this, almost $100 million is attributed to the approach system.

Traffic over the new crossing together with traffic on the San Francisco-Oakland Bay Bridge will be enough to pay for the $250-million investment by the use of 35-cent tolls on both facilities. The fact that the present toll is 25 cents is foreseen as one of the stumbling blocks. However, the feasibility studies pointed out that the crossing with minimum approaches could be built for $180.9 million and financed by a $180-million bond issue through 25-cent tolls. There is a good possibility that the legislature in its March session will amend the law to permit such construction. If no action is taken in March, the Toll Bridge Authority must proceed with the entire scheme.

The studies were made by the Department of Public Works' Division of Toll Crossings under the direction of N. C. Raab, chief of the division. Traffic and financial consultants were Coverdale & Colpitts. Engineering consultants were Charles E. Andrew, O. J. Porter and Ralph Smillie.

Toll Bridge Authority action on the report was to authorize additional studies of alternate approaches. They also went on record as being against starting construction until the state legislature has met in March.

Coverdale & Colpitts estimates that during 1962 (first full year of operation predicted on a 4½-year construction period) the new crossing would divert 19% of the traffic from the existing Bay Bridge. The Bay Bridge would carry an estimated 26,491,000 vehicles in 1962 with the southern crossing carrying 8,593,000. With traffic continuing to increase, the Bay Bridge would reach its 37,000,000 vehicle annual capacity by 1969. The southern crossing would have to absorb future traffic increases, reaching its 33,000,000 vehicle annual capacity by 1986.

Total cost of the complete program including interest and reserves is estimated at $327.5 million. The additional money over the proceeds of a $250-million revenue bond issue would come from interest on unexpended construction funds, operation of the Bay Bridge during the construction period and Bay Bridge reserve funds.

Most ticklish part of the construction program will be the subaqueous tubes that are to carry traffic under the ship channel. This part of the work is estimated at $101.4 million. To provide a 1,500-ft-wide channel, with minimum depth of 50 ft below M.L.W., three 2-lane tubes are called for. With a 3½% maximum grade, total underwater length is to be 5,807 ft. Each 2-lane tube will be made of 29 sections 200¾ ft long and 37 ft outside diameter. The tube sections will be cast in dry docks or shipways and floated to the site. The same procedure was used in 1926 for the Posey tube between Oakland and Alameda. And this program also calls for a parallel to the Posey tube.

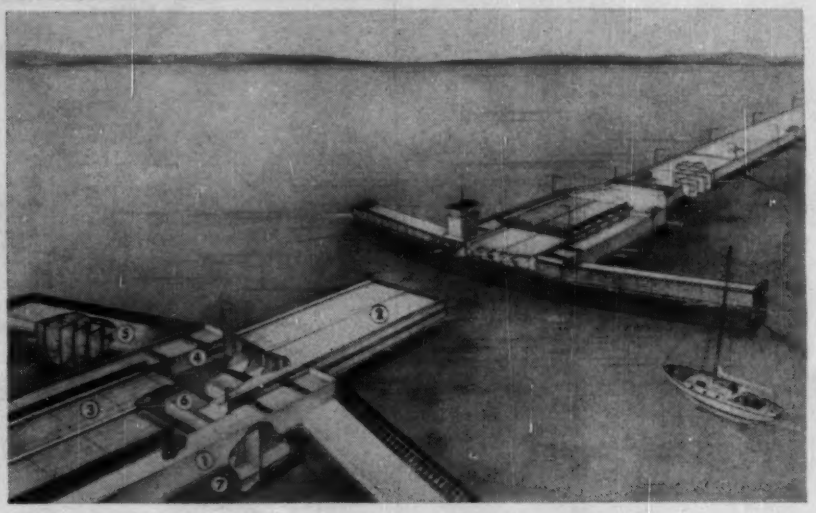
Because of poor support characteristics, the bay bottom mud will have to be dredged out and replaced with sand. And sand islands will have to be constructed at either end of the subaqueous tubes to provide for transition from trestle to tube as well as to support ventilation buildings.

The major part of the length of the bay crossing will be trestle estimated to cost $30 million. Present design thinking calls for an 87½-ft-wide deck supported by pile bents at 60-ft centers. Piles would be concrete or a composite of concrete and steel. And 14 prestressed concrete girders would span between bents.

The remaining part would be a 1½-mi fill on the East Bay side that would include the toll plaza.

Total cost of San Francisco approaches is pegged at $54.5 million. That includes a six-lane, double-decked, elevated structure that extends toward downtown San Francisco branching into two four-lane connections. Also planned is a connection with the Bayshore Freeway. If the legislature cuts down the program, the crossing would end in an interchange structure at Third and Army Sts.

East Bay approaches are estimated to cost $44.5 million. This includes a connection with the Eastshore Freeway, a freeway connection through Alameda and a new subaqueous tube between Oakland and Alameda. A reduced program would keep the Alameda tube, but most of the rest of the east approaches would be eliminated.



THE DRAW SPANS of the second Lake Washington Bridge at Seattle will be retracted into chambers spanned by sections of the deck that can be raised about 8 ft to clear the deck of the draw spans. The main elements of the draw spans are as follows: (1) flanking pontoon; (2) draw span; (3) lifted deck section; (4) gear for operating draw span; (5) fender pontoon; (6) submerged strut; (7) anchor cable.

Bridge Planned Despite Objections

Despite strong objections to the location, the Washington State Toll Bridge Authority is making plans to call bids late in January for construction of an $18-million floating concrete bridge across Lake Washington east of Seattle.

The bridge will be similar in design to the first Lake Washington floating bridge that has been in use since 1940, and which last August reached the 40,000-vehicles-per-day peak load for which it was designed. Principal difference will be in the draw span. The existing bridge is forked at one side of the draw-span opening to form a lagoon into which one of the pontoons is drawn to allow passage of large ships. The resulting curves in the roadway developed into serious traffic hazards.

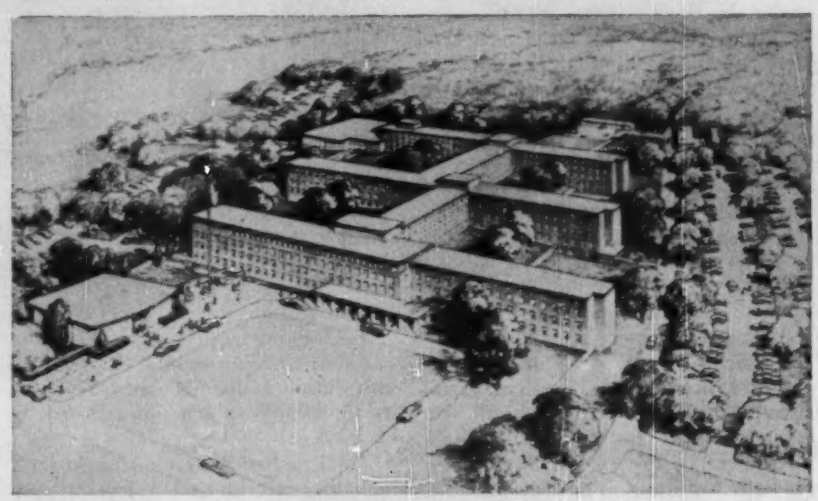
The draw span of the second bridge will have two sets of moving elements. At either edge of the opening there will be a section of the bridge deck which rises about 8 ft on "thrusters," allowing the retractable pontoons to slide back under the raised sections of the bridge.

"This type of draw span can be operated faster and with less than half the power of the span on the existing bridge," said Charles E. Andrew, chief consulting engineer for the authority. "It also will eliminate the bypasses around the draw bridge lagoon."

The draw span will be for vessels requiring more than 60 ft clearance. Vessels requiring less clearance can go under approaches at either end of the span.

The contract for which bids will be called next month will involve approximately 75% of all construction required for the project, Andrew said. Additional approach work will be contracted for later, after the expected sale of revenue bonds next May.

Principal objections to the location came from W. E. Parker, Seattle city engineer, and from groups which contend that the Seattle approach would damage seriously the University of Washington arboretum, on land owned by the Seattle Park Board. Parker and John D. Speath, Jr., director of planning for the City Planning Commission, had recommended a site farther north, near the San Point Naval Air Station, but had been overruled on grounds that the Navy raised objections.



New Home for the Atomic Energy Commission

A new $10-million headquarters building for the Atomic Energy Commission will go up this spring on a 109-acre site near Germantown, Md.—some 20 mi from present headquarters in Washington, D. C.

The building, a wing-type structure of monolithic reinforced concrete, will have four stories, plus a basement floor partly above ground. It will feature a 300-seat auditorium, cafeteria, and parking areas to handle 800 cars.

Work on the new headquarters is scheduled to be completed late in 1957. Meanwhile, plans are going ahead for another AEC project—a $6-million Medical Research Center to be built at Brookhaven National Laboratory, Upton, N. Y.

The new facility, to cover an 118,000-sq-ft area, will house a nuclear reactor designed specifically for medical research and treatment. It also will contain a research hospital, an industrial medicine branch, and six research divisions.

The medical reactor at Brookhaven will be one of the first two in the U. S. The University of California already has filed license applications for construction and operation of a medical reactor on the University of California campus at Los Angeles.

Architect-engineer for the new headquarters building is the New York City engineering firm of Voorhees, Walker, Smith & Smith. Architect-engineer for the Medical Research Center will be Eggers & Higgins, New York City; structural engineers, Weiskopf & Pickworth; mechanical engineers, Syska & Hennessy.

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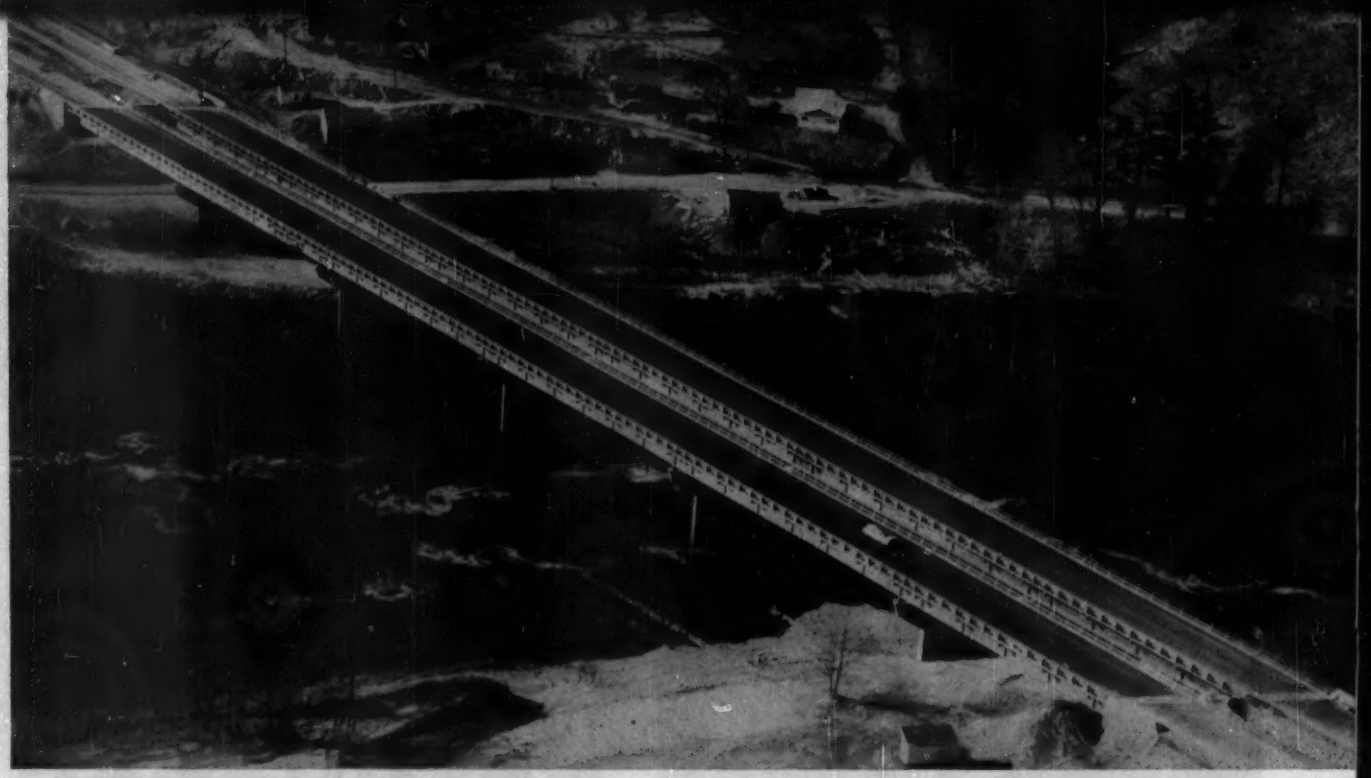


LONGEST BRIDGE on the newly-opened extension is this structure across the Androscoggin River. The span measures 846 ft.

Maine Ends Second Round of Turnpike Building

With the cutting of the ceremonial tape last week, Maine brought the total mileage of its turnpike system up 107. Newly opened is a 63-mi section that extends from Portland to the state's capital, Augusta.

Like the 44-mi original, the extension is a four-lane, limited access highway consisting of two 24-ft roadways. Outside shoulders are 8 ft wide; inside shoulders are 4 ft wide and are separated by an 18-ft median.

Unlike the older section of the turnpike which has a raised median, the extension employs a depressed center strip. It is felt that the depressed median is just as safe but will provide less expensive drainage and better storage for snow.

Curves have been kept to one degree and grades are held to 3%.

The base courses for the roadways of the new extension consist of 20 in. of selected granular material topped with 14 in. of compacted gravel. Pavement of the original section has a base of selected granular material ranging in depth from 30 to 42 in.

Surfacing on the extension consists of 4 in. of penetration macadam topped by 3 in. of bituminous concrete. This compares with 5 to 6 in. of penetration macadam and 2 in. of bituminous concrete which was used to pave the older section. Shoulders on the extension are paved with 3 in. of macadam.

Eliminating all grade crossings, the new section has a total of 91 bridges—only 10 of them over rivers or streams. The longest measures 846 ft and spans the Adroscoggin River.

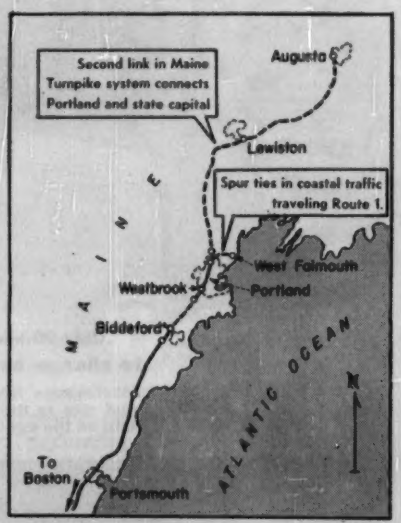
The bridges called for 35 mi of steel H-piles and 12 mi of cast-in-place concrete piles. This was because of deep deposits of marine clay, particularly in the Portland area. Longest pile driven was 246 ft; another was sent down 174 ft.

Construction involved moving 20,000,000 cu yd of earth, sand and gravel and 1,000,000 cu yd of rock. Bridges and abutments took 96,000 cu yd of concrete, and drainage required 38 mi of pipe. Other requirements were 23,322 tons of steel, 11,500,000 gal of asphalt and 1,330,000 tons of crushed aggregate.

Work on the extension was handled by 28 prime contractors and numerous subcontractors. Final paving was undertaken by three—Lane Construction Corp., Meriden, Conn.; Savin Construction Corp., East Hartford, Conn., which subcontracted the work to Warren Bros. Roads Co., Cambridge, Mass.; and W. H. Hinman Co., North Anson, Me.

Like the older section, the $59-million extension has been financed through revenue bonds. The $20-million old section was refinanced in a new $75-million issue—at a higher interest rate—so that revenues from the older portion could be used in amortizing the extension. However, the Maine Turnpike Authority recently announced that it will have to sell additional bonds—probably not more than $3,750,000—because bad weather last year delayed construction and because some costs ran higher than expected.

Members of the quasi-public Turnpike Authority are Paul C. Thurston, chairman; Lloyd B. Morton, vice-chairman; Frank S. Naiman; Charles W. Diggery and David H. Stevens, chairman of the State Highway Commission, ex officio.



DOTTED LINE indicates location of extension. Solid line represents old turnpike.

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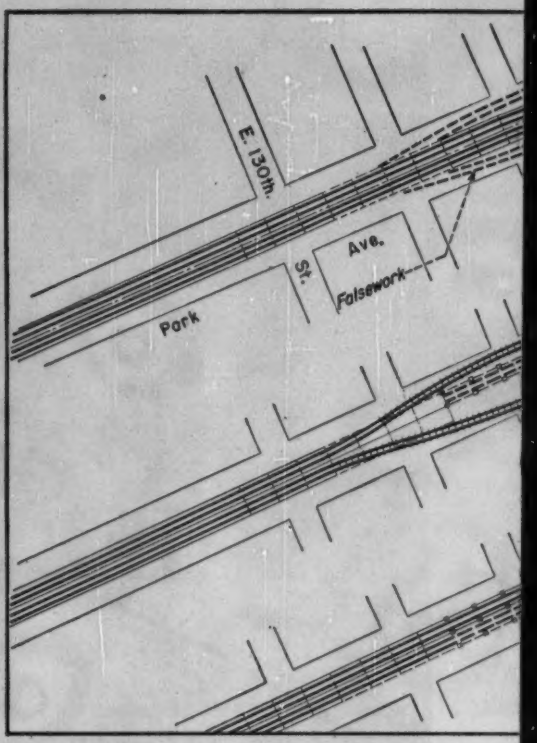
PROBLEM for designers & constructors was that old swing span had to remain in service, but only available site for new structure was practically on top of the old one. Thus construction had to be carefully scheduled.

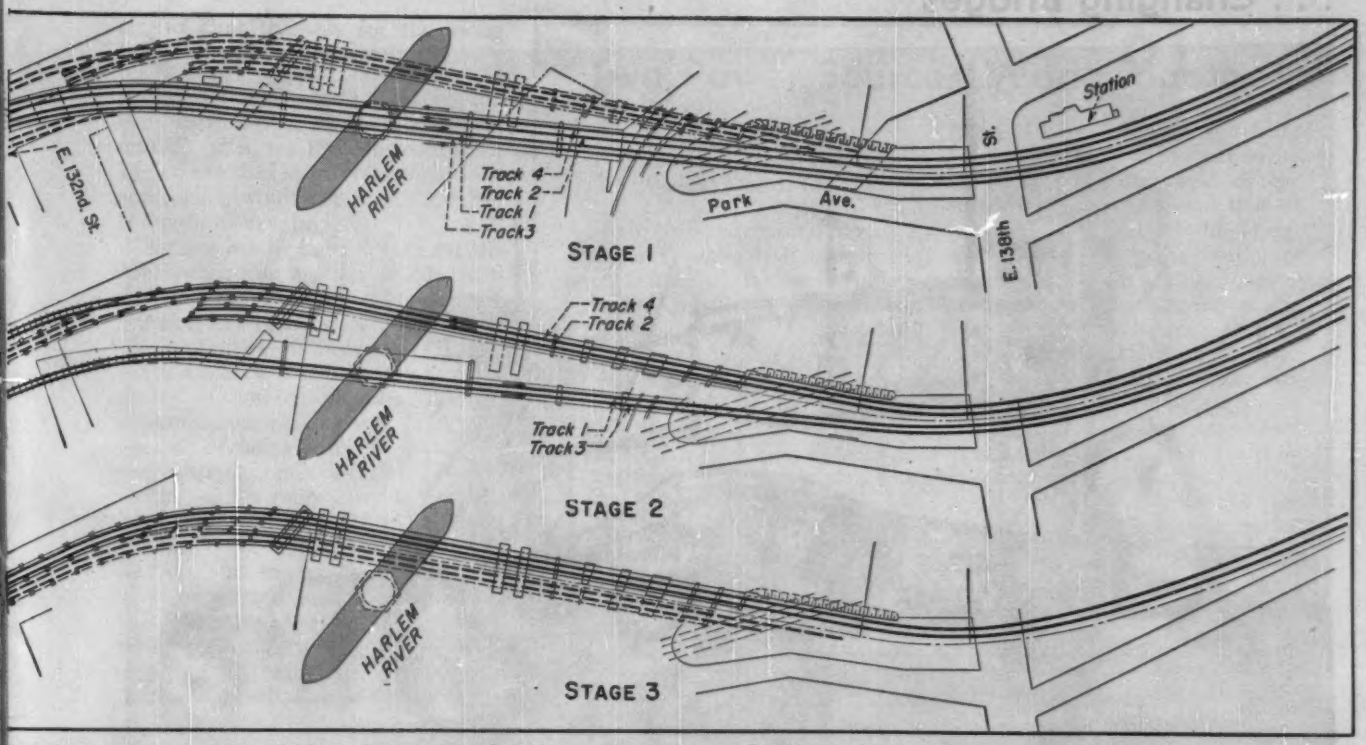


ANSWER worked out by New York Centra ahead. New span carried two-way

Changing

When the problem is to build a massive steel lift bridge almost on top of an equally massive swing bridge—and the swing bridge carries the main tracks of one of America's major rail-

Tight fit for falsework was necessary on Manhatta ing apartments. New approach will flatte right-of-way for railroad.



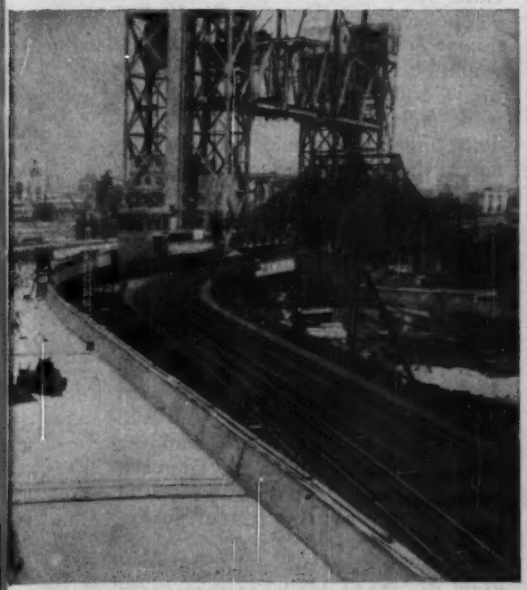
engineers was construction of falsework to carry track during construction, staged shifting of operations onto new structure as construction went traffic during transition.

Railroad Bridges in Midstream

roads—the key to the job is care and safety, not speed.

That's why contractors for the New York Central Railroad have been at work for five years—and will be at work for another year—building an $18 million double-lift bridge over the Harlem River that will replace a 63-year-old swing structure. And seven years of planning preceded construction.

The problem of keying construction operations to train movements, river traffic, cramped working and storage space, simultaneous reconstruction of streets in the area, to say nothing of



side of the work, where track was very close to adjoin- curve for trains entering bridge. Trackage is main line

Cutover was necessary at Bronx end, where alignment of new bridge cuts across old approaches. As soon as track was shifted to one span of new structure, half the old roadbed was cut away, but swing span kept operating.

Old and new are side by side, as steelworkers complete closure of second of two new lift spans, above 63-year-old steam powered swing span below.

live third rails and the usual welter of city utilities is worth careful study. The solutions worked out by the railroad's engineering staff and the contractors spell a successful construction job.

• **The site situation**—The four-track main line of the New York Central runs straight north out of Grand Central Terminal, underground under elegant Park Avenue to 96th street. There, it emerges onto an elevated structure through increasingly grimy and jampacked slum sections to the point near 135th street where Park Avenue disappears into the Harlem River—at that point the boundary line between Manhattan and The Bronx.

The elevated tracks turn to the east, cross over the old swing span, and come to earth in The Bronx, swinging northward again to follow the east bank of the Harlem for some miles.

On the Bronx side of the river, the tracks are elevated for 400 ft to cross over a local service road, and over a section of one of the city's major expressway routes—the Major Deegan Expressway—which connects northward to a parkway system leading out of the city. Normal street traffic in the area is extremely heavy. Underground in the same area is a twin-tube section of the city's subway system.

Over this section of track, the Central operates an average of more than 500 commuter and through train movements each day. Additionally, there is considerable switching movement as cars are moved out of the terminal area into yard facilities along the Harlem in the Bronx.

The Harlem River itself is a busy waterway carrying a heavy barge and small freighter traffic at this point, since it forms a convenient connection between the East and Hudson rivers, and is the site of much industry that depends on water transportation.

The swing structure had been developing ailments over many years that by 1950 made replacement a necessity. The fourth railroad bridge to stand on the site since 1841, the swing span was a remarkable structure in its day as one of the first all-steel structures in the United States. But now, it refused to move in one direction—could only be opened by moving the span from east to north. And it showed other signs of wear and advancing age.

Best solution, Central engineers decided, was to replace the structure.

• **How to do it**—The railroad's service could not, of course, be interrupted. And no additional space was available for new right-of-way and track.

So the new bridge had to be built almost directly atop of the old one, its construction schedule carefully keyed to an elaborate plan for shifting the tracks and keeping the old bridge in operation until the last necessary moment.

Here's what the Central finally decided upon:

The new bridge—to consist of two double track lift spans side by side—would be founded on piers enough to the west of the old structure to permit work on them without interference. This alignment would, incidentally, flatten the curve necessary for trains to enter the bridge. The westerly of the twin set of towers carrying the lift span thus would be entirely clear of the old bridge—and these towers and their accompanying 1,400 ton steel lift section would be built first. The easterly towers, however, would encroach on the approaches to the old span on the Bronx side. So, as soon as the westerly section was built and operating, two lines of track would be shifted to it and half the approach to the old span would be cut off, to permit work on the second towers and lift.

There would be an added difficulty: Since the old bridge had to remain in operating condition, the new spans would have to be built high in the

air, to clear the way for the swing bridge

• **Design**—The Central's engineers, under Chief Engineer G. A. Noren (now retired) called for the construction of 14,000 ton steel structure, which, with approaches, would comprise the 1,780 ft length of new bridge.

Approaches to the lift span on the Manhattan side are 863 ft long, carried on a series of steel columns, each founded on 14-in. steel piles, driven 70 ft or more to bedrock. The lift spans are each 380 ft long, center to center of towers, providing normal clearance over the water of 25 ft, and capable of being lifted to provide a maximum clearance of 135 ft.

The steel towers carrying the lift mechanism, are each 218 ft high, and straddle two concrete piers, spaced 40 ft c-c. The towers have an overall width of 77 ft, and house within them various control stations both for the bridge and for railroad signal and switching systems that must be meshed with the bridge operation.

On the Bronx side, the elevated section of 450 ft is carried on reinforced concrete piers, with spans varying between 46 and 55 ft.

Five of the river piers had to be built under air to reach bedrock that was in one case 80 ft below water level.

• **Construction**—First job for the joint venture contracting firm of Walsh-Connolly (Walsh Construction Co. and Peter F. Connolly Co., both of New York) was to set up the elaborate temporary structure to carry the main line tracks around the construction area. Senior & Palmer was associated with Walsh-Connolly on the original contract.

These by-pass structures, built of timbers up to 12 x 12 in. in size and resting in some places on wood-pile bents, completely blocked the remaining area of Park Ave. not already occupied by the existing elevated structure, and required closing off the street to traffic.

Simultaneously, the contractor began driving piles for temporary work bridges to the site of the river piers, and wood sheeting for cofferdams.

The five river piers were put down under air to considerable depths—55 to 80 ft—under almost uniformly difficult conditions that found the hard granite backbone of the city sloping away sharply, so that the caissons had to go down with one edge resting on rock, the other on assorted soils and muck until firm footing was reached on all sides. The deepest caisson—80 ft—is on the Manhattan side; the biggest of the piers was 125 x 28 ft in plan. Reinforced concrete, to be left architec-

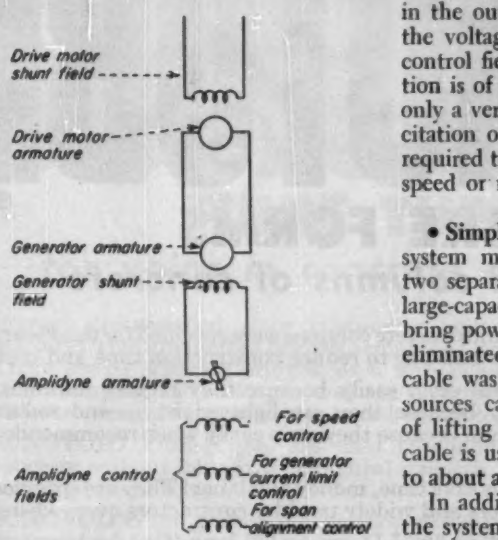
Two Power Sources Work Together

C. P. Hamilton
Engineering Department
General Electric Co.

From a mechanical-electrical standpoint, probably the most unusual feature of the new Harlem River lift spans is the fact that lifting mechanisms are driven with power from separate sources, one on each side of the river.

The two 1,400-ton spans can be raised 109 ft 9 in. within 90 seconds, to provide a clear opening of 135 ft above mean high water. The 208-v, 3-phase, 60-cycle power for their operation comes, on the Bronx side, from the network electrical system on that side of the river, on the Manhattan side, from network power there.

Considering that this is a tower drive system that requires the two ends of the span to operate at the same speed at all times to maintain alignment, it was apparent to engineers that the power self-synchronizing system could not be utilized, since a system (selsyn) can use one power source or the other, but not both simultaneously.



• **Solution**—A successful solution worked out by the General Electric Co., was the use of an amplidyne control system.

The basic function of this system is to supply controlled excitation to a direct-current generator shunt field. The voltage and current output of the generators—and hence the speed and torque of the motor to which the generator armature is electrically connected—is influenced by the voltage signals applied to the fields of the amplidyne.

For example, one field of the amplidyne is so connected that its influence is to control the bridge speed in response to the position of the master switch on the control desk, and by the slowdown and stop control limit switch. Another field winding of the amplidyne exciter is so connected that the current output of the generator is sharply limited, to a predetermined value, thus restricting the stress on the machinery and ropes due to acceleration and seating of the span. Still a third field is connected to an adjustable rheostat, which in turn is connected with other mechanisms to sense a difference in the position of the two tower drives. If necessary the device alters the speed of the drive motors to maintain the span in alignment.

The amplidyne itself is a mechanical-electrical device that looks like a small direct current generator. Its design is such that its output voltage responds in split seconds to signal voltages applied to the control fields—its "build up" or amplification factor causes a large change in the output voltage compared to the voltage applied to the various control fields. Since this amplification is of the order of 10,000 to 1, only a very small change in the excitation of the controlling fields is required to cause a motor to change speed or restrict its torque output.

• **Simplified system**—Because this system makes possible the use of two separate power sources, a long, large-capacity submarine cable to bring power across the channel was eliminated. For emergency a small cable was installed so either power sources can be used for both sets of lifting mechanisms. When this cable is used, span speed is reduced to about a third of normal.

In addition to this direct saving, the system also solves a number of other problems in the control and operation of the lift spans:

• A close control of span speed, regardless of load conditions, without recourse to mechanical braking.

• Rapid automatic slowdown at the nearly-open and nearly-closed positions of the span.

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turally plain, makes up the piers up to the footings for the steel towers.

With the river piers in place, crews of the American Bridge Company moved in on the job, while Walsh-Connolly Superintendent J. F. Armstrong and his crew turned to the construction of the permanent approaches to the bridge.

• **Approach work**—Pile-driving here also involved tearing up sections of paving, complete relocation of several water and sewer lines, and careful location of the many other underground utilities in the area. When cranes or other equipment that would come close to or overhang operating tracks had to be used, they had to be carefully spotted both as to position and time of use to mesh with train operating schedules.

The heavy steel (14 in.) H-piles were tied together at the ground surface with 4-ft-thick reinforced concrete caps which supported the steel columns to carry the track.

The existence of the bypass tracks and their heavy supports posed an additional problem in construction of the permanent approaches. A large percentage of the permanent piles were driven through holes cut through the bypass structure; other piles had to be driven in 10-ft sections by machines working under the structure.

• **Deck**—The deck framing itself is designed for Cooper E-60 loading. The Manhattan end consists of transverse steel beams, carried on through girders varying in length up to 66 ft, the beams spaced 2 ft c-c; the Bronx approach is carried on longitudinal beams. The built-up girders are 6 ft 2½ in. in depth between piers.

On top of this, 2½ in. steel plate is welded, to become a base for 7 in. of reinforced concrete. This concrete is treated to make it waterproof, and is then topped with a 1½-in. asphalt block, then about 14 in. of track ballast, and finally the track itself. Deck concrete is designed for a 2,500-psi strength. The lift spans themselves have open timber decking, although the combination of ties and wooden drip blocks between them give the appearance of a solid deck.

Steel erection by American Bridge (with William Fuller as superintendent) was accomplished by travellers moving out from both towers toward the center. Principal problem for the steelworkers was the handling of unusually heavy members—some of the trusses weighed up to 40 tons—and of raising and placing the 15½ ft dia sheaves that are mounted at the top of each tower as part of the lifting mechanism for the river spans.

• **Move over**—As soon as the northerly lift span was completed, and the elaborate signal system installed, track was laid on the approach section on the Manhattan side, train traffic on the two southbound tracks was shifted to it, and the bypass tracks abandoned and dismantled.

With this operation completed, American Bridge moved on to the old Bronx approach to the swing span, and cut it away so that steel erection crews could go to work on the southerly towers. For reasons of balance, of course, the swing span had to be left intact.

For bridge operators, by the way, this means that two operations must be completed each time the bridge must be opened for water traffic: First the lift span must be brought up; then with the way clear, the swing span opens.

Steel erection (135 ft above the river) is now complete on the second lift span. When Walsh-Connolly crews have finished track laying, the final move of the tracks will be made, and then work can begin on another year's job—complete removal of the old span, its abutments and its river pier.

Still to be completed, also, is a crossing on the Bronx side of twin tubes of the city's Lexington Avenue subway line, which crosses the Harlem on a line parallel to and almost under the bridge site.

A. J. Zwart is chief engineer for the Walsh-Connolly joint venture; and Robert Eaton is resident engineer at the site for the New York Central.

Use of Untreated Water by Cities Drops to Less Than 1%

Today less than 1% of the population in U. S. communities of 25,000 and over uses untreated water for its daily supplies.

The Public Health Service—announcing results of a nationwide inventory—discloses that more than 52,000,000 people in these larger communities now depend on surface sources for water. This compares with less than 40,000,000 in 1947. In the same eight-year period, the number of people (suburb dwellers included) served by municipal water systems has increased from 61,800,000 to 82,600,000.

The Service points out that the sharp increase in the number of people dependent upon surface waters in these communities shows the need for conserving natural water supplies through pollution control and other practicable measures.

The inventory, conducted at eight-year intervals, uses data provided by state health departments and local officials.

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Precast pretensioned slabs containing hollows formed by low-cost SONOVOIDS are used as bridges across the Corning Canal in California. There are 84 separate bridges, each slab being 3'2" wide x 1'2" deep and averaging 33' in length and are designed for H-20 loading. The slabs are simply supported reinforced by pretensioned high stress wire.

SONOVOID Fibre Tubes are used to eliminate the dead weight of concrete without impairing structural strength. SONOVOIDS save concrete and reinforcing steel!

SONOVOIDS are specifically developed for use in bridge deck, wall, floor and roof slabs . . . for precast units or units cast in place.

Supplied in specified lengths or sawed to your requirements on the job. Sizes from 2.25" to 36.9" O.D. up to 50' long. End closures available.

For complete technical data and prices, write

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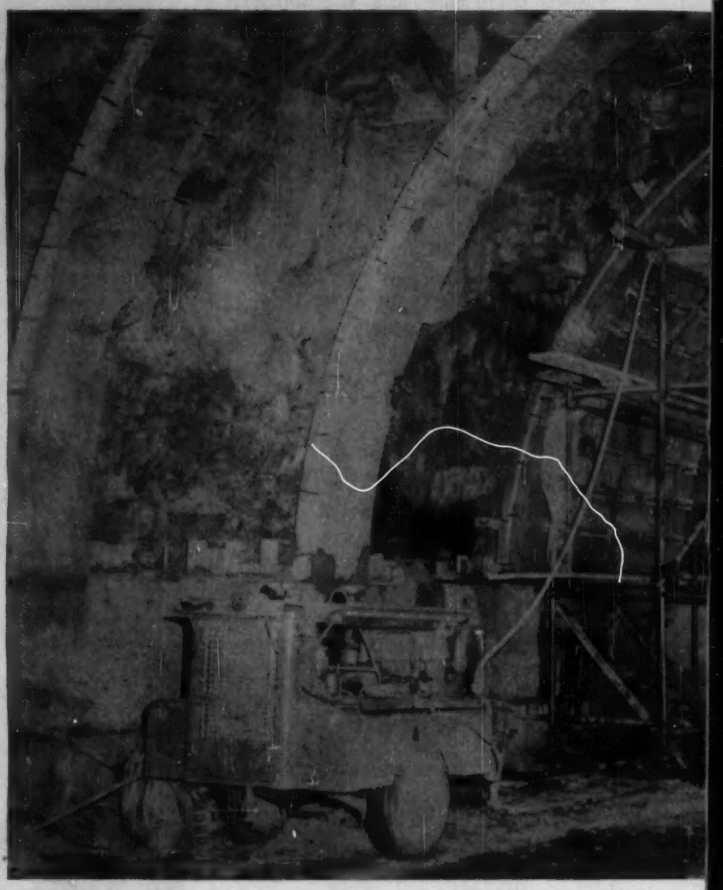
Precast liner rings . . .
. . . 2 ft wide by 10 in. thick, were precast of lightweight concrete in Portland, Ore., casting yard. Each quarter-circle ring cost $130 delivered to the job 175 miles away.



Simplified formwork . . .
. . . for cast-in-place concreting for highway tunnel lining in Mt. Rainier National Park was achieved by hanging forms from precast rings. Scaffold provides work platform and is not for form support.

Precast Rings Eliminate Shoring for

An unusual combination of precast and cast-in-place concrete was used for lining a 280-ft long highway tunnel in Mt. Rainier National Park in Washington. Precast rings were placed first and supported forms for cast-in-place concreting. They also served as form templets.

The work is part of an 18½-mile improvement program for the Stevens Canyon Highway that also includes slope stabilization and road surfacing. General contractor is J. A. Terteling & Sons, Inc.

Purpose of the tunnel lining is to protect traffic from falling rock fragments and from dripping water. Plans prepared by Bureau of Public Roads engineers called for either precast or cast-in-place lining, both having a 10-in. thickness. Subcontractor on the tunnel lining work, Young & Smith of Salt Lake City, Utah, proposed that the lining be done by combining precast and cast-in-place techniques.

Here's how the scheme worked: First a 5½-ft high wall was cast in place up to the spring line of the tunnel. Then the precast rings were placed on 9 ft 8 in. centers—leaving 7 ft 8 in. between rings. The rings are notched at the bottom to mate with a notch on the cast-in-place wall. And each pair of quarter circle segments mate at the tunnel arch crown. Reinforcing steel was placed between the tunnel rings. After this, forms were positioned with the forms being supported by the rings. Finally concrete was pumped in place forming the 14½-ft radius tunnel lining.

The precast concrete rings are designed to support the entire deadload of the tunnel lining. Thus no interior falsework is required to support the cast-in-place concrete. And the rings form a templet that makes placing formwork easy.

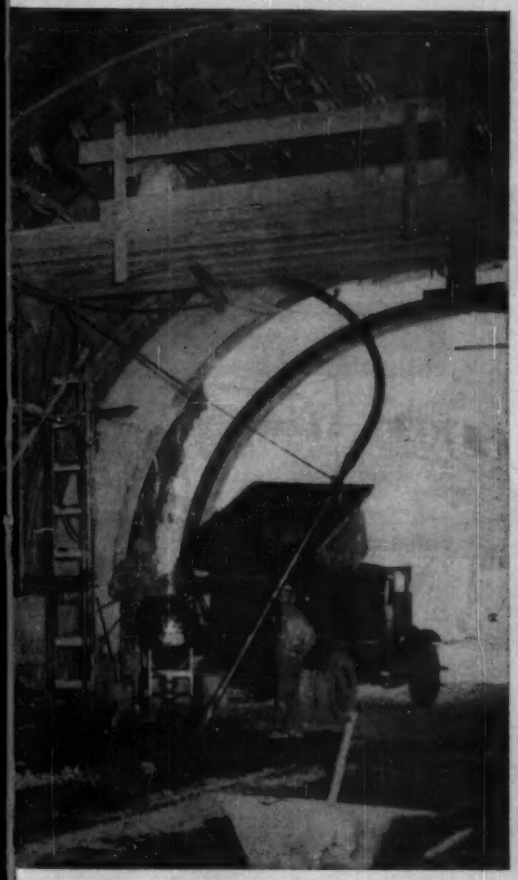
• **Formwork**—Projecting from the precast rings on 15-in. centers are ½-in. bolts. Walers for formwork are suspended from these ½-in. bolts by means of ¾-in. C bolts. The double 2x6-in. walers support plywood panels that form the interior surface of the tunnel lining. The plywood was manufactured to fit the inside radius at only a nominal additional cost. Two 4x8-ft plywood sheets side by side span the 7 ft 8 in. opening with a 2 in. lap over each ring. Enough plywood was provided for three pours.

Forms for the top surface of the tunnel lining were formed with 1x8-in. shiplap held by ordinary wire ties. This inexpensive lumber was left in place.

Concrete for the tunnel lining rings was made with lightweight expanded shale aggregates, an 8-sack mix resulting in a 28-day strength of up to 3,500 psi. Unit weight of the rings is about 100 pcf. There were 52 quarter circle precast rings required and each weighed about 4,050 lb.

Although specifications for cast-in-place work called for 1½-in. aggregate, the contractor proposed using a maximum size of ¾ in. This was to facilitate concrete pumping operations. Specifications required a 6½ sack mix but the contractor used a 7 sack mix to secure additional water allowance and increase of the slump with resultant easier pumping.

Concrete after being batched and mixed was transported to the placing machine in a truck-mounted dump body. It was charged into a concrete



Tunnel Forms

pump in ¾ cu yd batches. Air pressure at 100 psi forced the concrete into the forms.

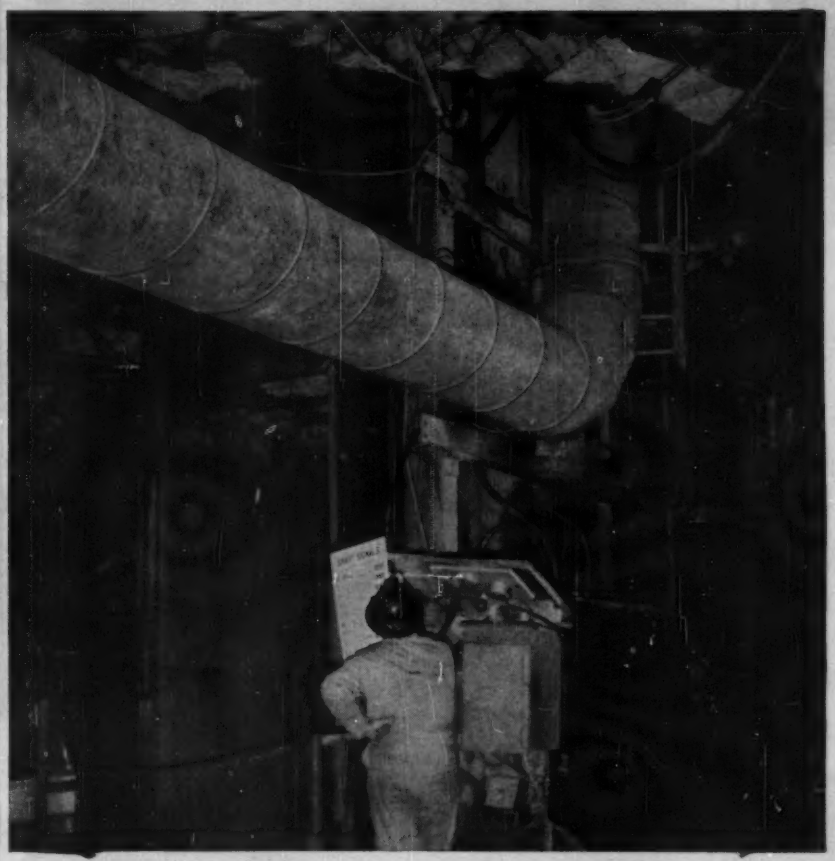
Doors in the forms were provided about 60 deg above the springline. Concrete was placed through one of these openings to almost the crown of the tunnel. Then the hose was moved to the door on the other side and the remaining portion pumped full. With large-slump concrete being used, only a small amount of external vibration was necessary.

Contract price for the tunnel work was $250 per lineal foot for concrete above the spring line. This amounts to $173 per cubic yard.

The combination of precast and cast-in-place concrete resulted in considerable savings in construction time. And equipment on the job was considerably lighter than would have been required for full cast-in-place lining.

The Stevens Canyon Highway work is a project of Division 8 of the Bureau of Public Roads, F. E. Andrews, division engineer. Tunnel lining work was directed by R. B. McMinn, division bridge engineer. R. M. Barron was resident engineer.

AIR-CONDITIONING FOR TUNNEL WORK



There's no better "air-conditioning" system for underground construction than lines made up of Naylor Spiralweld ventilating pipe and Naylor Wedge-Lock couplings. With this combination, lines can be installed quickly and easily extended as work progresses. The coupling provides remarkable accessibility. Space on only one side of the pipe is required for connection, permitting the line to hug the walls wherever space is limited. For push-pull ventilation, you'll do better with Naylor pipe and Wedge-Lock couplings. **Write for Bulletins No. 507 and No. 514.**

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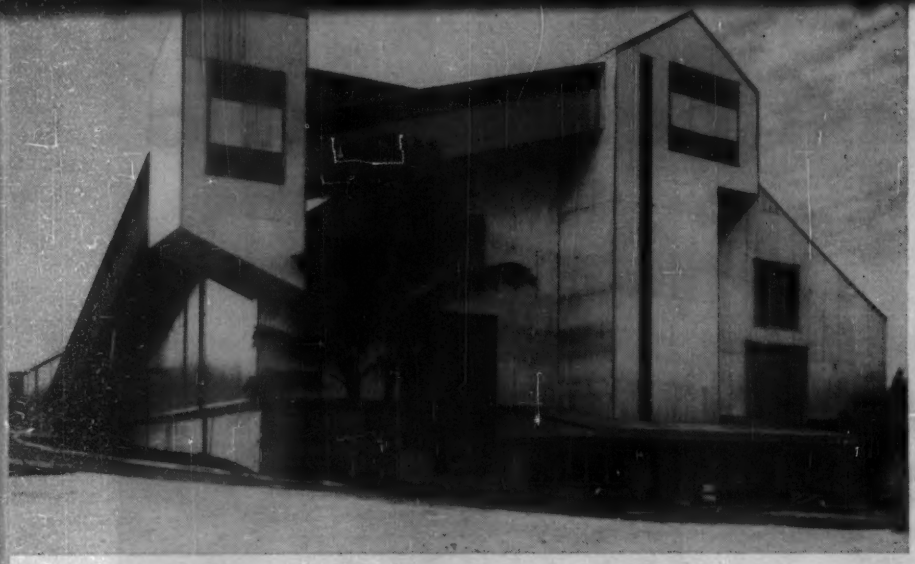
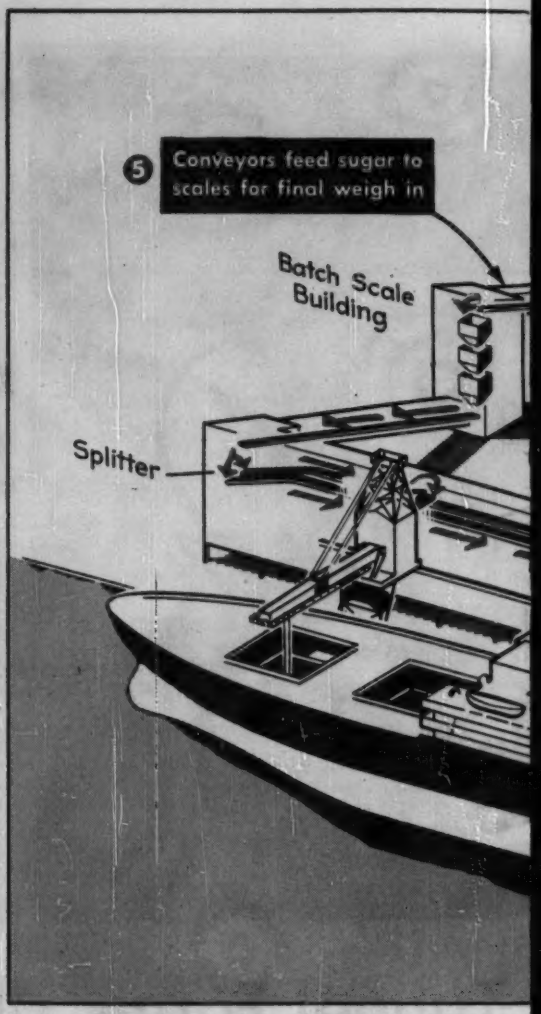
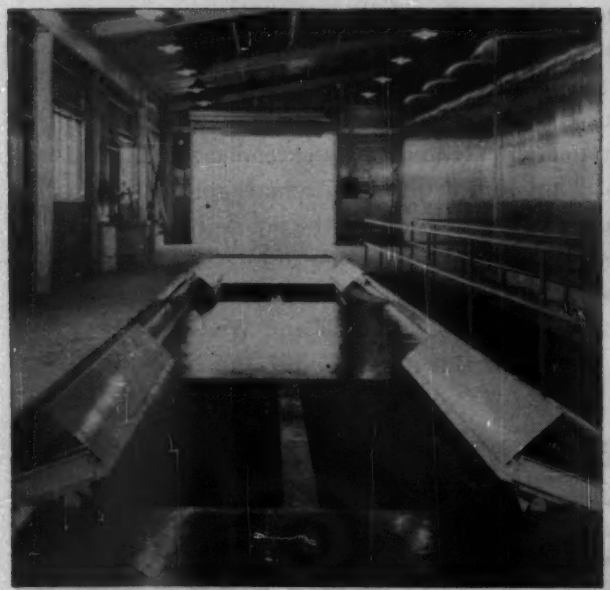


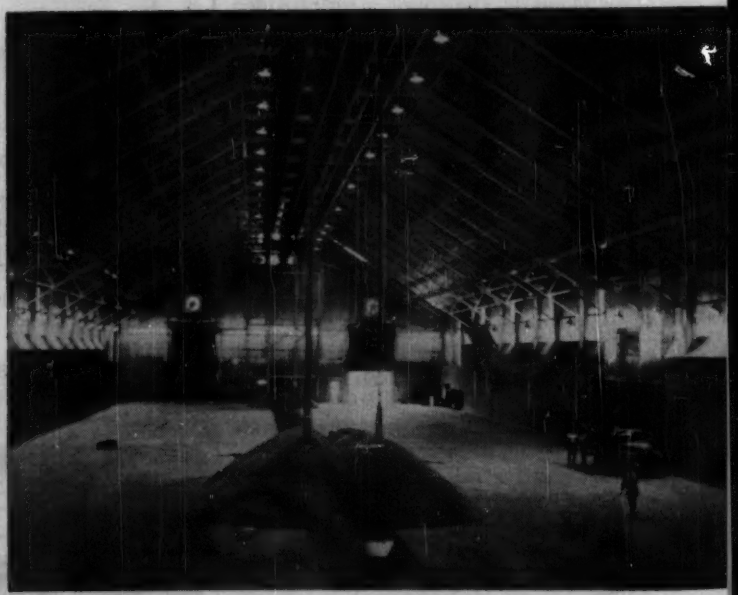


Successive conveyor belts move huge quantities of sugar in and out of storage in the new aluminum-enclosed Honolulu Bulk Sugar Plant

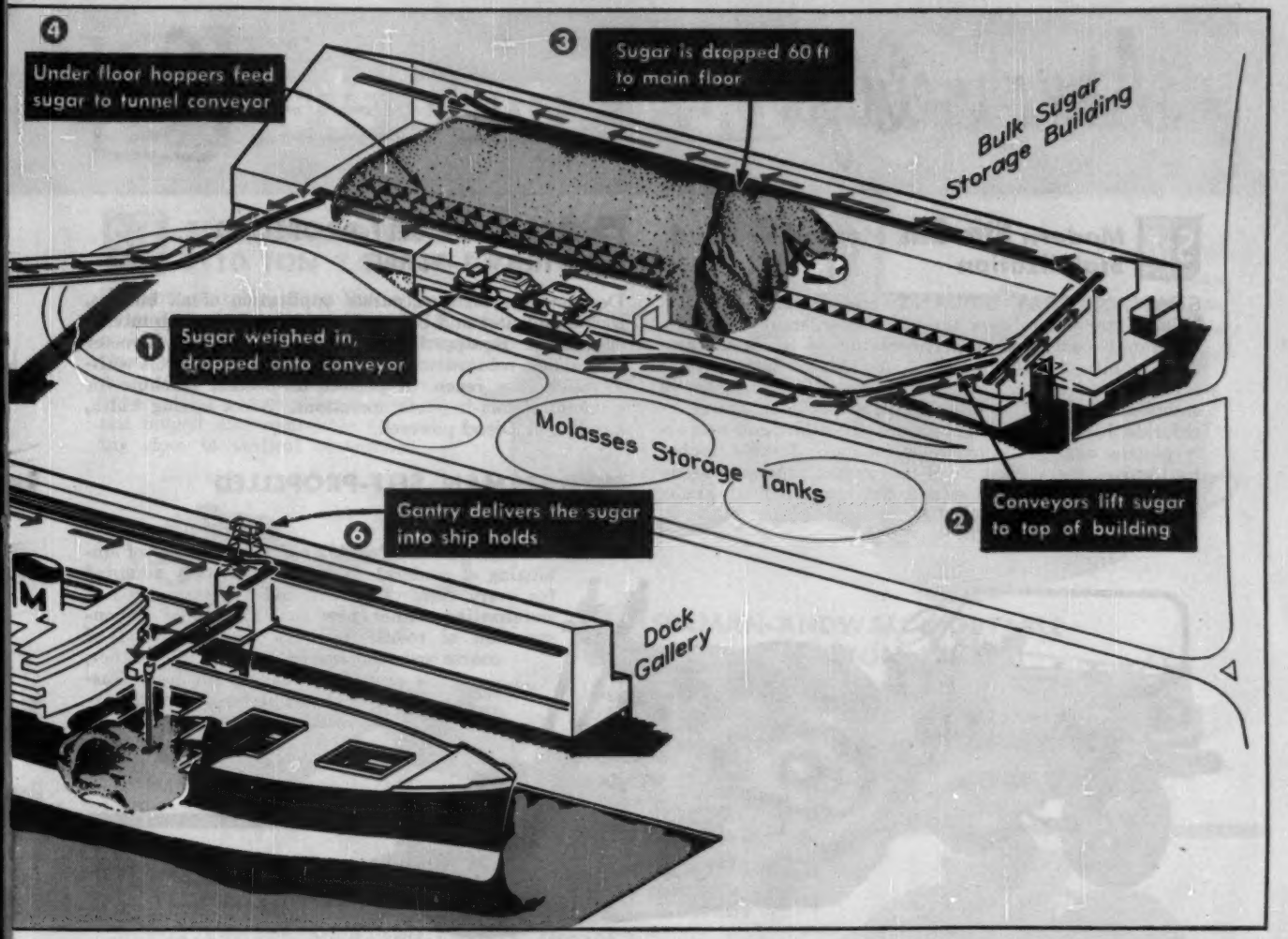
It Stores Sugar—Building or



HYDRAULIC GATES of a 70-ft, 50-ton scale open to receive sugar brought in on trailer trains in 26-ton loads.



STORAGE AREA with 35,000-ton capacity receives sugar from conveyors 60 ft above, discharges it to tunnel conveyor.



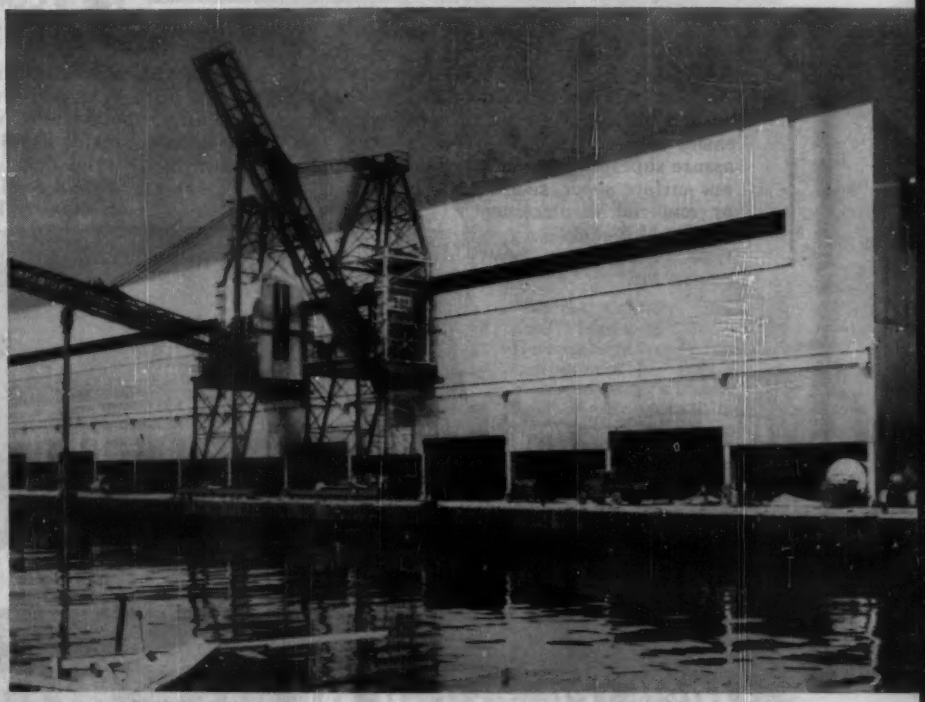
Machine?

Incorporating almost every labor-saving device possible for the high-speed handling of sugar in and out of storage, the new $2,250,000 Honolulu Bulk Sugar plant can ship 750 tons of sugar per hour on the average. The design resulted from a world-wide study.

Located at Pier 19 of the Oahu Railway and Land Co. on Honolulu Harbor, Hawaii, the plant consists of a 110x420-ft steel-framed storage building with walls and roof of aluminum sheet, a batch scale building for weighing outgoing sugar, a dock gallery equipped with gantries for loading ships and three molasses storage tanks with 21,000-ton capacity.

For humidity control, the storage building is virtually air tight. Six giant fans circulate air inside.

Law & Wilson, architects-engineers, Honolulu, designed the plant, and Hawaiian Dredging Co., Honolulu, erected it.



DOCK GALLERY 480 ft long is equipped with two movable gantries. Fed by conveyors, the gantries pass sugar directly into ship holds.

Announcing New Complete S-A

Modern Stū-Bilt Method of Road Stabilization

SEAMAN TRAV-L-PLANT and PULVI-MIXER build better road bases through faster, more thorough, accurately controlled in-place mixing — a normal production rate of up to A MILE A DAY of 22-foot road! Exclusive advantages include: Mixing for *all* types of stabilization including bituminous, soil-cement, gravel, or chloride, both sodium and calcium. Blending and properly placing aggregates and fines for more durable, higher loadbearing bases. Completely correcting aggregate segregation. Mixing, blending and finishing to final grade, partially pre-compacted ready for final rolling.

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Designed for highly accurate application of all binders, including water and bitumen, simultaneously with mixing operations. Equipped with pump, spray bar, tachometer assemblies, volumetric meter. All operating controls within quick easy reach. A perfect, *all-process* machine for economical mix-in-place operations. 7-foot mixing width, gasoline or Diesel powered.

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The stabilization "workhorse" for all types of stabilizing at moderate investment. Widely accepted for every class of mixing and processing of soil stabilization, either new construction or re-construction of roads. Delivers accurate blend of coarse and fine aggregate — for all-weather, low cost, long-wearing surfaces. Gasoline or Diesel powered. 7-foot mixing width.

COMPACTOR SELF-PROPELLED, PNEUMATIC

Revolutionary new design in heavy duty rubber tire rollers. Self-propelled for transport road speeds up to 20 m.p.h. Provides new "straight down" pressures . . . eliminates usual pushing action, surface shear, scuffing, material displacement. Power steering — full 180° turn on 20-foot road beds. Four 500-gal. Liquid Ballast Compartments — 5 Ton — 15 Ton — 20 Ton —

New SEAMAN-ANDWALL Portable and Self-Propelled Rollers and Compactors offer many new advantages in road building . . . Greater visibility and maneuverability, easier transport to the job, plus many new features that assure superior compaction, more accurate rolling — without surface sheer, scuffing, or material displacement. Choice of models for every type of operation, every contractor.

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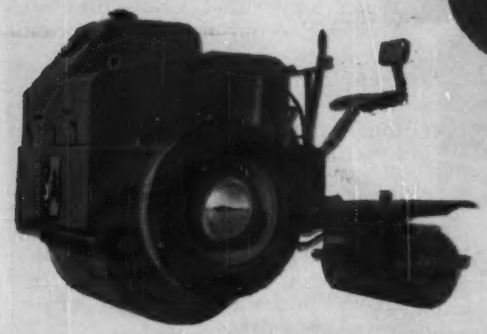
Open the way to BETTER ROADS...at lower cost!

Stā-Bilt Line *for Road Construction*

S-A SEAMAN-ANDWALL PORTABLE 7-10 TON TANDEM ROAD ROLLER

The first portable 10-ton Roller that is fully automatic, can be made portable in 90 seconds, and provides easy one-man operation. Equipped with 61 H.P. engine, fuel-saving TURBO-TORQUE drive. Hydraulically lowered trailing wheels are hinged and removable for rolling close to vertical obstruction.



S-A SEAMAN-ANDWALL PORTABLE TANDEM 2-3 TON ROLLER

Highly maneuverable, compact, versatile, "one-man" Roller, designed for a wide variety of jobs. Gasoline powered, with compaction roll designed for liquid ballast. Hydraulically lowered pneumatic tired wheels for easy trailing and transport. Wheels removable for close-up rolling to avoid hand work.

S-A SEAMAN-ANDWALL SPREADERS

For Superior Efficiency in Spreading All Materials ... Cement, Sand, Salt, Cinders, Gravel

There's a SEAMAN-ANDWALL Spreader for every need, in models and sizes to fit every road-building budget. Each one has unique advantages and features to meet specific requirements — in all types of materials, in daily production, and in accuracy of volume and placement.

S-A HERCULES CEMENT SPREADER

Heavy duty spreader for soil-cement paving. Auto-type differential provides efficient transfer of power, hand-lever controlled. Has strike-off bars for accurate quantity control up to 10-foot width. Dual Pneumatic tires for traction. Easy to attach, requires no special tail gate.

S-A CENTURY CEMENT SPREADER

A new idea in spreader design, providing absolute accuracy in cement spreading. Positive volumetric control of cement governed by free-running tachometer wheel which cannot skid or slow down. One-man remote operation from truck cab.

S-A CENTURY MATERIALS SPREADER

The SA Century "Posi-Feed" Model HY-4 . . . Demountable tray for seal coating can be replaced with spinner for spreading sand or chlorides. Vibratory mechanism in the truck body maintains steady movement of materials to avoid uneven distribution. Eliminates hand feeding from truck body. One man operation.

Write for Bulletin

TODAY'S HIGHEST STANDARD OF EFFICIENCY AND ECONOMY IN MODERN ROAD BUILDING . . .

S-A SEAMAN-ANDWALL CORPORATION
261 North 25th Street, Milwaukee 1, Wis.

Frank Whitney, of Walter Kidde, suggests . . .

A Special Kind of Engineer

The need for integrating architecture and engineering in the construction of industrial plant facilities may some day be exemplified in a new breed of professional specialist: a man licensed both as an engineer and as an architect.

If so, Frank L. Whitney—elected this month vice-president in charge of engineering of Walter Kidde Constructors, Inc., engineers and builders of New York and Houston—will be among the fore-runners of the specie. The 42-year-old Whitney is a registered architect in 14 states. This fall, he took New Jersey state board examinations and now has his professional engineer's license.

Although Whitney was trained as an architect at Western Reserve University, the major portion of his experience has been, as he puts it, "engineering-oriented." This, he believes, is the natural consequence "once an architect makes industrial plant design his principal outlet."

Whitney's first job was with B. F. Goodrich Company, where for four years he got his feet wet, industrially-speaking, as a junior working on plant expansion, primarily in the then-new fields of plastics and synthetic rubber. He started out as an architect, but as he puts it "most industrial plants simply don't have enough stairs and washrooms to keep an architect busy full-time."

His next job was with The H. K. Ferguson Company, where he came in at the outset of the big defense construction program prior to World War II. Although hired as an architect, Whitney again found the architectural pickings meager. On the other hand, there was lots to do on the engineering side of Ferguson's plant design and construction business. For nearly eight of the pre-war, war and immediate post-war years, Whitney seldom thought of himself as an architect, although he is firm in his belief that architectural training is a definite plus mark. His engineering responsibilities increased with each project and by war's end Whitney was regarded in Ferguson as a full-fledged project engineer who had successfully handled some of the firm's major work.

Whitney's big opportunity to do an integrated architectural and engineering job (which he believes is the only sound way to approach industrial building) came in 1947, when he was

Frank L. Whitney

given the job of coordinating design for a new $20-million processing plant for Corn Products Refining Company at Corpus Christi, Texas. Whitney says he approached the basic problem as an architect, but his approach was always tempered, consciously or unconsciously, by the mechanical requirements of the process (this is why he feels the architect alone cannot cope with the fundamental problems of industrial construction). The result was a wall-less group of buildings that not only produced efficiently, but also has had the distinction of being the only industrial plant considered by the Museum of Modern Art worthy of inclusion in its "Postwar Architecture: USA" exhibit a few years back.

Whitney joined Walter Kidde Constructors in mid-1953 as chief engineer. Directing a staff of engineers and working with client representatives who were almost exclusively engineers, Whitney felt he "should have a certificate on the wall to point to." He began boning up on engineering subjects, took the exams and passed. He won't be happy until two facing walls in his office are equally balanced with state licenses covering both engineering and architecture.

Panero Engineering Firm Opens Two Offices Abroad

Guy B. Panero Engineers, New York, has announced the opening of offices in Rome and Paris.

The Rome office will participate in engineering design for two projects in the Middle East. One is the Royal Medical Center for the city of Bagdad; the other is a seven-year social and economic program of the Iranian government.

Among the projects in the firm's Paris office is the modernization of the American Express Building, on which the Panero organization is one of the consulting engineers.

Sanitary Engineer Joins Firm of Hazen and Sawyer

Herbert E. Hudson, Jr., former chief engineer of the Illinois State Water Survey, has joined the New York engineering firm of Hazen and Sawyer.

His 24-year career in sanitary engineering has included operation, research and design with the Chicago Experimental and South District filtration plants and water purification research at the University of Illinois. As chief engineer of the Illinois Water Survey, Hudson continued his studies of filtration theory and headed the agency's program of collection of basic hydrological data.

During World War II he was attached to the Water Supply Branch, Engineer Board, Ft. Belvoir, Va., and was later sent to Europe for intelligence work on German military water purification methods.

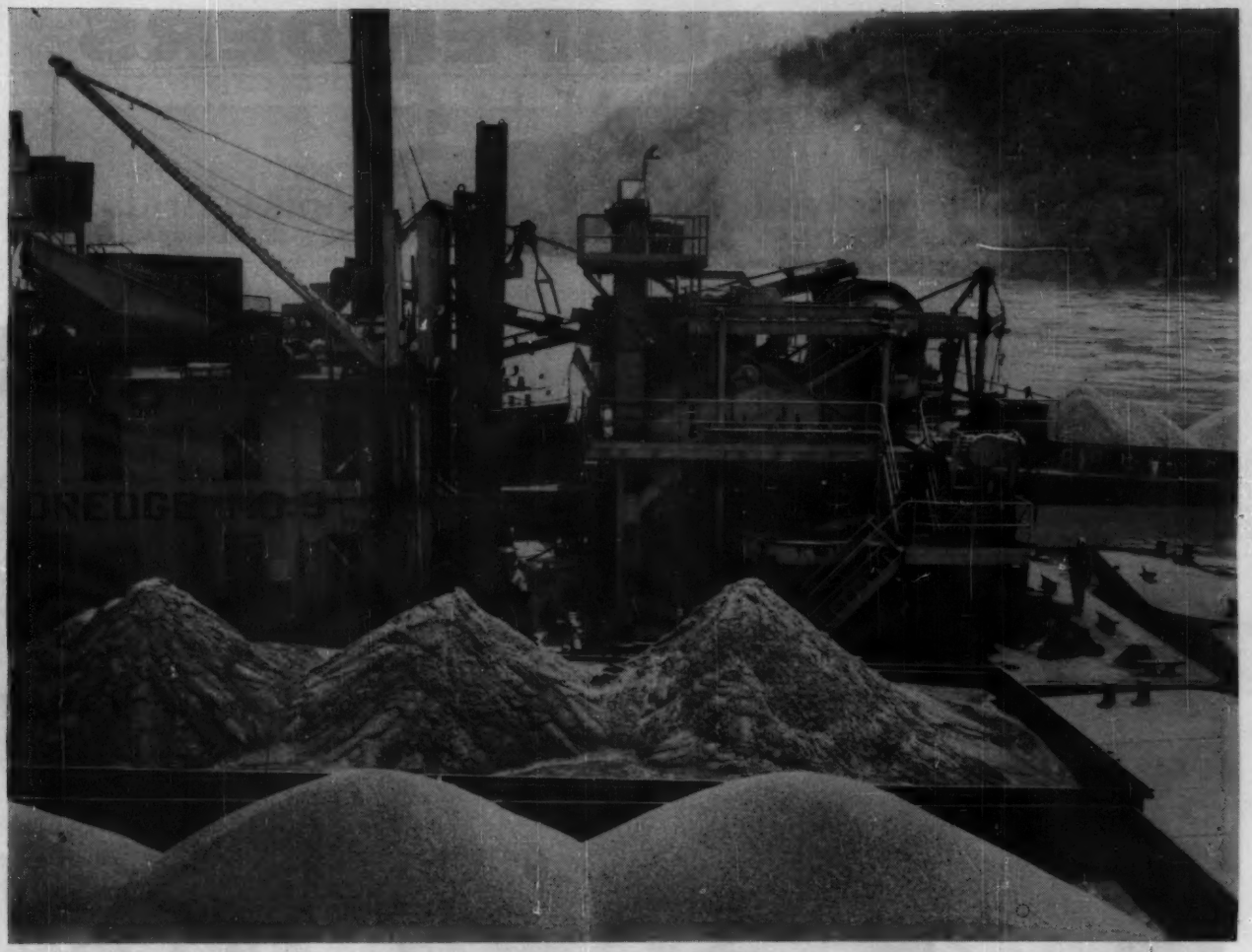
SAME Post Organized At Keflavik, Iceland

Those engaged in building up the defenses of Iceland have formed an Iceland Post of the Society of American Military Engineers at Keflavik Airport. The charter was formally presented last month by Brig. Gen. John W. White, commander of Iceland Defense Force, a U. S. tri-service combat team within the NATO structure.

First president of the organization, which now claims 125 members among the American military and civilian and Icelandic engineers engaged in the current construction program is Maj John W. Califf of the Corps of Engineers.

The need for an organization that would further engineering techniques in Iceland had been felt ever since the arrival of American contractors and engineers in 1952.

SAME was selected as the national society best suited for the purpose, because it embraces all fields of engineering and includes military, associate and foreign members.

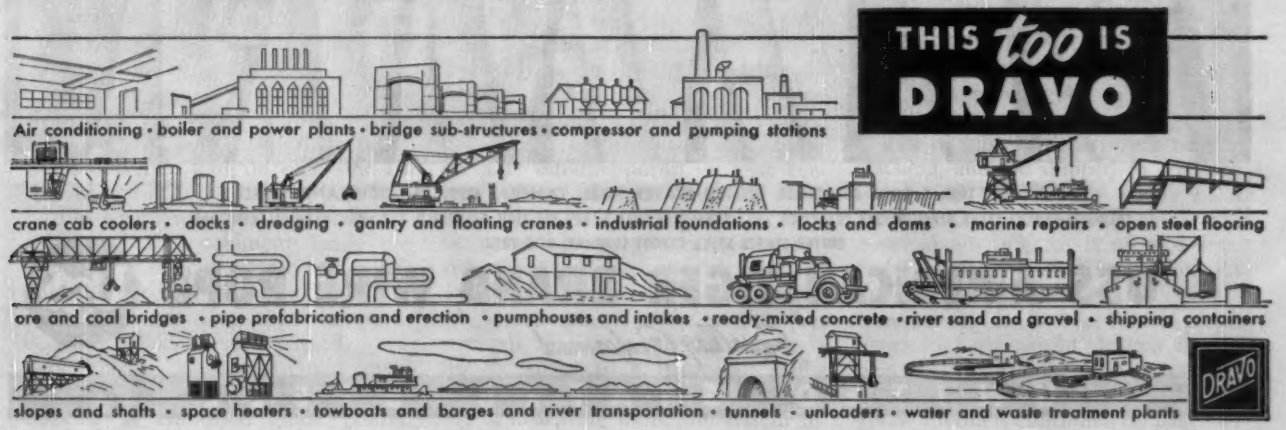


DRAVO'S HEAVY-MEDIA PLANT IMPROVES QUALITY OF GRAVEL

Following several years of experiments with various ways of gravel-processing to improve its performance in quality tests, river gravel is now being produced commercially in this country through the heavy-media process by the Keystone Division of Dravo Corporation.

The processing, carried on in a floating heavy-media plant which was developed and built by Dravo, places gravel dredged from the Ohio River into a heavy liquid of finely ground magnetite suspended in water. Objectionable particles of "soft" gravel, porous gravel and foreign materials, which are lighter than the heavy liquid, float to the surface and can readily be removed. This process also permits dredging in areas previously considered worthless because of contamination by coal deposits and other undesirable material.

Dravo's Keytone Division, largest producer of sand and gravel in the Pittsburgh area, also operates a towing service on the rivers and transports a substantial tonnage of coal on the Monongahela. Dravo takes pride in the part Keystone is playing in supplying sand, gravel and ready-mixed concrete to many of the projects in Pittsburgh's tremendous building program. Dravo considers customer satisfaction an essential element in all its products and services. DRAVO CORPORATION, PITTSBURGH 25, PENNSYLVANIA.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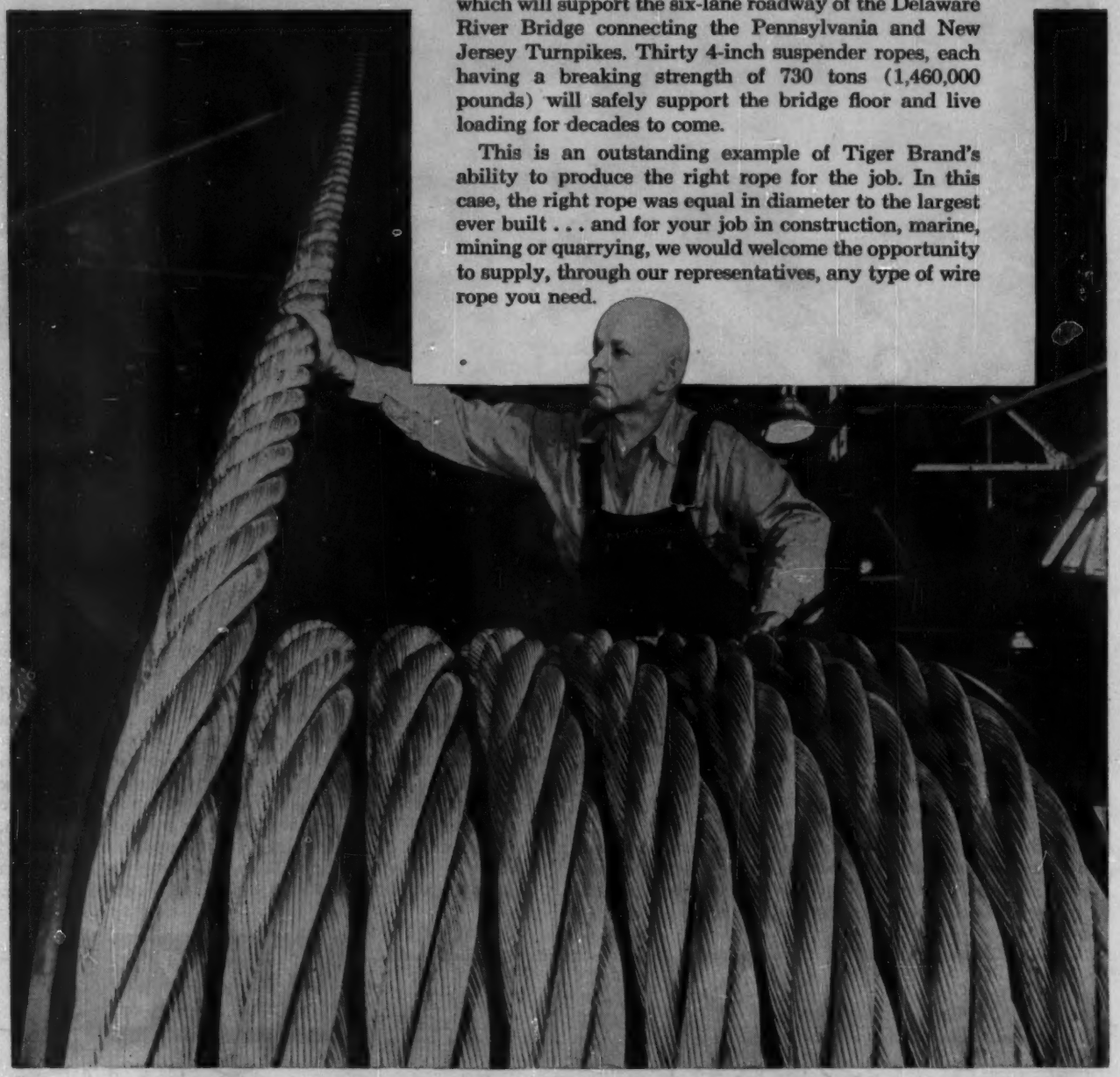
GIANT SUSPENDERS

In The Making

for the Pennsylvania-New Jersey Turnpike Bridge



You are witnessing the "birth" of the huge steel ropes which will support the six-lane roadway of the Delaware River Bridge connecting the Pennsylvania and New Jersey Turnpikes. Thirty 4-inch suspender ropes, each having a breaking strength of 730 tons (1,460,000 pounds) will safely support the bridge floor and live loading for decades to come.

This is an outstanding example of Tiger Brand's ability to produce the right rope for the job. In this case, the right rope was equal in diameter to the largest ever built . . . and for your job in construction, marine, mining or quarrying, we would welcome the opportunity to supply, through our representatives, any type of wire rope you need.

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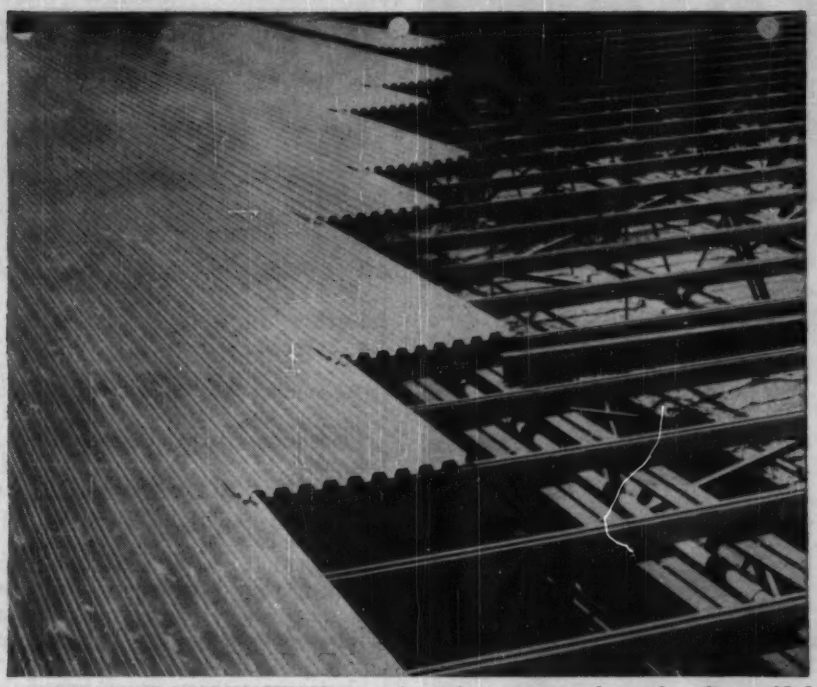
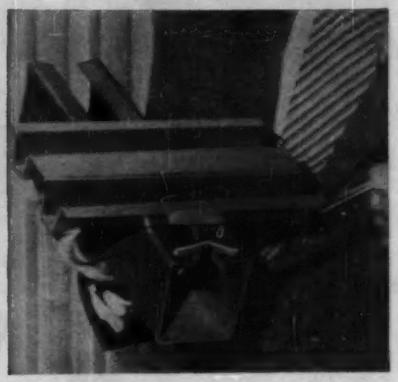


ALUMINUM ROOF DECKING goes down fast over open-box sub-purlins welded to building structure.



MILD STEEL galvanized pins expand after they pierce decking, hold panels securely to sub-purlins.

PANELS are rolled in single size that adapts to 2, 3 or 4 ft modules.

Jig-Set Purlins and Blind Fasteners Speed Aluminum Deck Installations

A new aluminum decking system, designed with an eye on speed and accuracy of erection, has roofed several commercial buildings in jig time, according to reports from contractors handling the jobs. While not radically different, several features of the system make it apparent that the manufacturer gave considerable thought to solving contractor's on-the-job problems.

• **How it goes up** First step in erecting the Alumadek roof is to set special open-box type sub-purlins, to which the aluminum decking is pinned. The manufacturer supplies a set of light metal jigs, which space the sub-purlins 2 ft on centers. Sub-purlins may be up to 30 ft long. Where the sub-purlins cross supporting beams (either building joists or purlins) two fillet welds one inch long on each side tie the sub-purlin to the beam. The sub-purlins have a maximum clear span of 8 ft, and the weldment lends the structure sufficient rigidity to eliminate the need for cross ties. After the sub-purlins are set, the aluminum decking is laid on and pinned down with special galvanized mild steel clips, which are forced through the decking at embossed guide points, corresponding to the spacing of the openings in the tops of the sub-purlins. The pins are self locking, and are inserted blind from the top of the roof. The aluminum panels overlap one corrugation, and one inch at each end. Each panel is 12 ft 1 in. long and 2 ft 1¼ in. wide, with 1 in. deep ridge. The lightweight and reasonable size of the panels permit a couple of men to carry about five panels at a time when shuffling them out on the roof, and one man can handle a single panel without difficulty.

• **How it stands up** For a roof structure with a rib depth of only 1 in. and a sub-purlin cross section of only 2⅞ x 2⅜ in., the deck system has good rigidity. At full rated capacity bearing load of 75 psf, the deflection produced is less than 1/360 of the span, based on 8 ft building-purlin or joist centers. The 0.024-in. aluminum sheet from which the decking is rolled is a medium-high strength corrosion resistant alloy, with a yield strength of 28,000 psi and an ultimate strength of 34,000 psi. The use of higher strength aluminum enables the decking to withstand normal roof traffic without damage.

For insulating roofs, the system includes special clips which are installed from the top of the roof to hold down insulation panels laid over the decking. The clips were designed to withstand 70 psf upthrust using 2 clips per 4 sq ft of insulation. For many installations, the roof does not require painting on either the exposed or interior side. The high reflective qualities and low emissivity of aluminum give the roof inherently good insulation characteristics.

The aluminum deck panels nest in stacking, and are shipped in enclosed wood skids of 1000 lbs each. Each skid contains 80 panels, which will cover about 1900 sq ft of roof area. Smaller packages of 250 and 500 lbs are also available. Sub-purlins are bundled in 4, 8, 12, or 16 pieces depending on weight desired in the field. METAL DECKING CORP., INDIANAPOLIS, INDIANA.

(*New Products continued on page 40*)

Crail Bros. Co., Long Beach, California, using a Moto-Crane with **two Waukesha Engines**—(powering the boom) a **140-GK Gasoline,** six-cyl., 4½-in. x 5½-in., 525 cu. in., 160 max. hp. at 2250 rpm; and (powering the chassis) a **145-GKB Gasoline,** six-cyl., 5¼-in. x 6-in., 779 cu. in., 240 max. hp. at 2400 rpm. Being spotted is a 22-ton Gardner-Denver mud pump with **two WAKU Waukesha** LP or natural gas units, six-cyl., 6¼-in. x 6½-in., 1197 cu. in.; each 213 continuous hp. at 1300 rpm.

EVERYWHERE in the industrial picture

WAUKESHA ENGINES

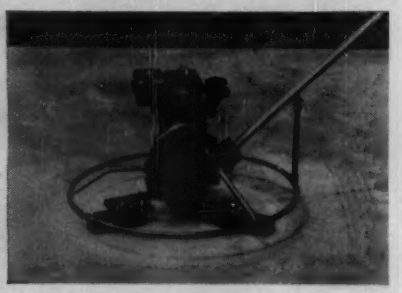
Multi-Unit Waukesha Horsepower—this MC-524 Lorain has it! So does this Gardner-Denver mud pump that's being spotted in the Long Beach outer harbor area. Two Waukeshas give the Moto-Crane safe, sure, steady power, with a ready reserve for heavy handling. Fast, flexible power, too, for speedy movability and reliable road travel. And the mud pump with its Waukeshas is powered to remove about 700 gal. of heavy oil mud per minute in oil well deep drilling jobs. Send for Bulletins.

286

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.

NEW YORK • TULSA • LOS ANGELES

. . . New Products



Rotary Trowels Add Stones For Grinding Flat Surfaces

Grinding blocks attached to the Stow Manufacturing Co.'s Roto-Trowel convert the unit into a surface grinder. The blocks, which are 2 x 3 x 8 in., attach to the trowel in place of blades by means of wing nuts and channel bars.

According to Stow, the grinders were developed after the company had received a number of requests for an accessory that could be used to grind down the seam between concrete blocks, or put an extra fine finish on flat surfaces.

The Stow G34 Roto-Trowel drives the blocks easily with a 2½ hp engine at speeds as low as 25 rpm. The 24 grit blocks are flat and have no ridges on the bottom. They will grind either wet or dry. Stow Manufacturing Co., 19 Shear St., Binghamton, N. Y.

Lightweight Jig Saw Bites With Canted Blade

Slight forward pitch on the blade of a new hand-held saber saw gives more bite and less blade drag, according to the manufacturer, resulting in greater cutting speed and chip clearance. The saw makes a vertical cut despite the blade pitch, since the base tilts to the same degree as the blade, maintaining a right angle between the blade and work piece.

A universal DC or 25/60 cycle motor, adaptable to 115 or 230v, drives the saw at 3000 ½-in strokes per min. The saw will cut straight lines or curves in wood, plastics or insulating board up to 1 in thick, piercing its own starting hole, if necessary. As a hack saw, the power tool will cut sheet metal up to ⅛-in thick. A motor blower exhausts on the blade to clear chips from the cutting line. A knife blade accessory is available for cutting soft materials such as insulation, foams, paperboard, leather or plastics sheeting. Retail price for the 480 saw is about $40. Millers Falls Co., Greenfield, Mass.

Obituaries

Milton Whitson, 77, structural engineer, died Dec. 15 at Englewood, New Jersey. His early association was with Stone & Webster Engineering Corporation, first as district manager in Seattle and then Pacific coast manager in San Francisco. During World War I he was commissioned a colonel in the Army Quartermaster Corps in charge of the Corps' construction division. He took part in the development of power plants and railroad rights in the Pacific Northwest as a partner with Grant Smith & Co. of St. Paul. For a period, he was vice-chairman of Ulen & Co. engaged in construction work in South America and Europe. Whitson later became a partner in Mason, Walsh, Atkinson & Kier during construction of the Grand Coulee Dam on the Columbia River in the State of Washington. Since his retirement as a member of the board of trustees of Englewood Hospital, Whitson devoted most of his time to the development of the building plans for the new Englewood Hospital. He graduated from the University of Illinois School of Architecture in 1901.

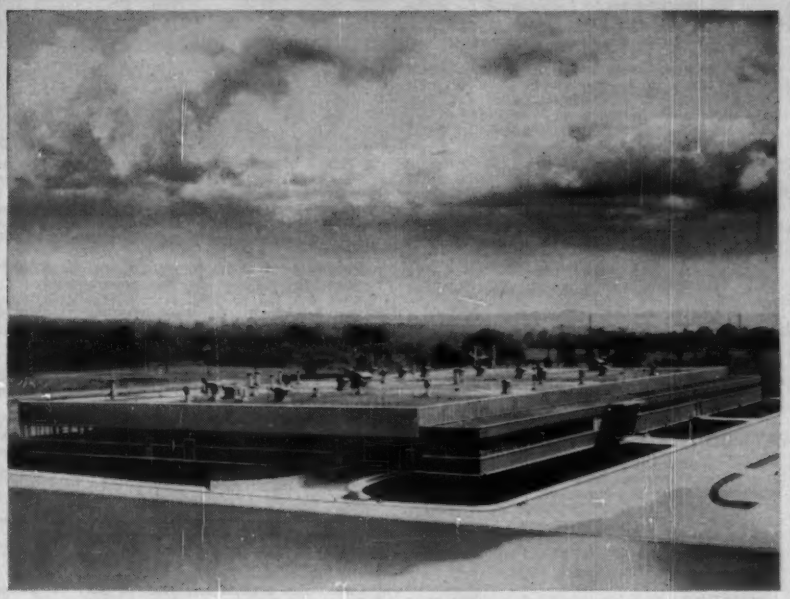
Harry O. Haake, 61, a director and vice-president of Ceco Steel Products Corporation of Chicago, died Dec. 3 in Los Angeles. Prior to his joining the Ceco firm he was employed by the Chicago, Milwaukee and St. Paul Railroad, the Illinois Highway Department and Kreshbiel Company. In 1921 he joined the Ceco firm as engineer for the Chicago District, moving on to manager of the St. Louis District in 1924. He was sent to Los Angeles in 1927 to open and assume charge of the firm's west coast plant and office operations. Haake, a graduate of the University of Illinois in 1918 with a degree of Bachelor of Science in civil engineering was appointed vice-president of the firm in 1936. He was a member of the Engineering Commission to draft the Los Angeles earthquake building code.

Virgil P. Reimer, 61, engineer of the Pacific Northwest and Alaska, died Nov. 26 at Anchorage, Alaska. Prior to concentrating in the field of engineering he practiced law in Seattle, and for a brief period in Anchorage. Reimer was an engineer for the Port of Seattle and worked for the Corps of Engineers during World War II, in Alaska and Canada. He was associated in the construction of a number of bridges in the Seward-Anchorage area. A graduate of the University of Wisconsin in law and engineering he has been director of the FHA in Alaska for the past two years.

Since HOPE'S 1818

STEEL WINDOWS HAVE THE STRENGTH AND RIGIDITY THAT NO OTHER WINDOW CAN MATCH

Lok'd Bar FACTORY SASH



New Super-Precision Plant for the Marlin-Rockwell Corp., Falconer, N. Y.
Wigton-Abbott Corporation, Engineers-Contractors

274 HOPE'S STEEL LOK'D BAR SASH
were used in the construction
of this modern plant.

The greater strength and rigidity of Hope's Steel Windows assure ease of operation and weather-tightness that will last the life of the building. In addition, their greater strength permits long, uninterrupted rows of windows; some of the openings in the building shown are more than 200 ft. long.

For full information on Hope's Steel Lok'd Bar Sash ask for Catalog 103E.R.

HOPE'S WINDOWS, INC., *Jamestown, N. Y.*
The Finest Buildings throughout the World are Fitted with Hope's Windows

QUEENS VILLAGE, N. Y. Bureau Contracts & Awards

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 4 Connecticut
STREETS AND ROADS
December 28 Massachusetts January 4 Connecticut

▲† **Mass., Chicopee Falls**—DORMITORIES—BA On Or About 1/11—U. S. Eng., 857 Commonwealth Ave., Boston, Zone 15, airmen's dormitories, communications transmitter, power and receiver bldgs., alterations and addns. to reconnaissance technical laboratory and communications and telephone bldg., and floodlighting for alert hangar apron, Westover Air Force Base, ENG-19-016-56-79. $1,500,000-$1,750,000. Plans deposit $50.

▲† **Mass., Falmouth**—HOUSING—BA 1/18—Purch. & Contg. Office, Otis Air Force Base, 505 family housing units Otis Air Force Base, $5,500,000. Plans deposit $25. CD 10/19.

▲† **Maine**—SPECIAL AAA FACILITIES—BA On Or About 3/1—U. S. Eng., 857 Commonwealth Ave., Boston 15, Mass., Special AAA Facilities, (Sites L-13, L-31, I-58 and L-85), Caswell, Limestone, Caribou and Connor, ENG-19-016-56-83, $4,000,000, Plans deposit $50. CD 7/21, under LB.

BUILDINGS—BA

▲ **R. I., East Greenwich**—INDUSTRIAL PLANT—BA 12/30—Bostitsh, Inc., c/o Charles T. Main, Inc., engr., 80 Federal St., Boston, Mass., 300,000 sq. ft. industrial plant superstructure, South County Trail. $3,000,000.

HEAVY CONSTRUCTION—LB & CA

▲ **RHODE ISLAND**—State of R. I. & Providence Plantations, Div. Purchases, Joseph L. Byron, purch. agt., State House, Smith St., Providence,
M. A. Gammino Constr. Co., 728 Valley St., Providence, R. I., LB $3,989,776. North-South Freeway over Providence River to Hayward Park Area, R. I. Contr. 5553, F.A. Proj. Nos. IN-03 (5) and UI-03 (6), Construction Contr. Three-Four, Providence-Hayward Park. Bids Dec. 14. CD 11/18.

▲ **CONNECTICUT**—State Hy. Comn., State Office Bldg., Hartford,
Conn.—**Poirer & McLane Corp.**, 33 W. 42 St., New York, N. Y., LB, $11,344,894. 16,628 ft. c. conc. paving, viaduct approx. ¼ mi. over Miamus River, 10 bridges in Greenwich and Stamford, Fairfield Co.;
Conn.—**Reid Contg. Co., Inc.**, 23 Main St., Woodbridge, N. J., LB, $5,490,233. 15,778 ft. c. conc. paving and 9 bridges in Stamford and Darien, Fairfield Co. Bids Nov. 21. CD 11/9.

▲ **CONNECTICUT**—State Hy. Comn., State Office Bldg., Hartford,
American Bridge Div., U. S. Steel Corp., 71 Broadway, New York, N. Y., CA $4,643,188. superstructure for Housatonic River Bridge, Stratford and Milford. Bids Oct. 31. CD 10/21.

BUILDINGS—LB & CA

▲ **High Voltage Engineering Corp.**, 7 University Rd., Cambridge, Mass., rejected bids Nov. 22, mfg. plant, South Bedford St. Rte. 128, BURLINGTON, MASS., Est. $2,000,000. New bids Dec. 13. CD 11/28, under LB.

▲ **James S. Kelleher Co.**, 1245 Hancock St., Quincy, Mass. LB $1,327,318. JUNIOR HIGH SCHOOL, QUINCY, MASS. City, School Dpt., 70 Coddington St., Quincy, Mass. Bids Dec. 8. CD 11/16.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 6 Pennsylvania
STREETS AND ROADS
January 6 Pennsylvania

▲ **NEW JERSEY-PENNSYLVANIA**—BA 1/12—Delaware River Port Auth., Administration Bldg., Camden, N. J. Contract No. 7, lighting and electrical work for The Walt Whitman Bridge Structure and Toll Plaza, Phila., Pa., for new bridge between Packer Ave., Phila., and Gloucester, N. J. Plans deposit $10; adv. ENR 12/22. CD 9/26/52.

BUILDINGS—BA

▲ **Pa., Phoenixville**—SCHOOL—BA 1/10—Phoenixville Area Joint School Bd., Senior High School, $2,000,000, The Ballinger Co., 121 N. Broad St., Phila., engr.-archt. CD 4/6/53.

▲ **N. Y., New York**—HOUSING—BA 1/24—New York City Housing Auth., 299 Broadway, Zone 7, (1) foundations and appurtenances (2) general constr. (3) foundation and general constr. (4) heating and ventilating, (5) electrical work and (6) plumbing for St. Mary's Park Houses (Proj. No. NYC-26) located in area bounded generally by E. 156 St., Forest Ave., Westchester Ave., Trinity Ave., E. 149 St. and Cauldwell Ave., Bronx Boro, Plans deposit $75; furnishing and installation of elevators, Plans deposit $25. $10,000,000. CD 4/6/55.

HEAVY CONSTRUCTION—LB & CA

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,
Latrobe Road Constr., Inc., P. O. Box 150, Latrobe, Pa. CA $2,193,956. one thru truss and I-beam bridge over Little Conemaugh River; rein.-con. pavement 13 ft. and variable on each side of trolley franchise area 0.38 mi., city of Johnstown and Franklin Boro, T.R. 260, Cambria Co. CD 11/23, under LB.

▲ **Rice & Weldman, Inc.**, P. O. Box 1386, Lancaster, Pa. CA $1,468,291. Contr. No. 4, general contract 8 m.g.d. filter plant, incl. filter bldg., clarifiers, two pumping stations, mechanical equip., river intake, LANCASTER, PA. City of Lancaster Auth., Council Chamber, Municipal Bldg., Lancaster, Pa. Grand total $2,154,931. Bids Nov. 10. CD 9/27.
Zimmerman & Walsh, Quarryville, Pa. CA $119,791. Contr. No. 5, electrical work on 8 m.g.d. filtration plant and two pumping stations. (Lancaster, Pa.);
East Penn Constr. Co., Landisville, Pa. CA $170,347. Contr. No. 10, New Holland pike distr. sys. incl. 26,010 ft. 4- to 16-in. pipe Class 150 M.J., 24 hydrants, 180 service connections. CA $169,199. Contr. No. 12, Willow Street distr. sys.; CA $227,303. Contr. No. 13. Neffsville distr. sys., (Lancaster, Pa.).

▲ **Horn Constr. Co. Inc.**, 2174 Hewlett Ave., Merrick, N. Y., CA $5,000,000. wharf repairs at Hog Island, PHILA., PA. Gulf Oil Corp., 30 St. and Penrose Ave., Phila., Pa. Bids Sept. 20. CD 9/9.

▲ **Wrights Contg. Co.**, Brookhaven Rd., Columbus, Ga. LB $2,771,077. Contr. PT-103 section of south approach expressway 0.96 mi., also 2,400 ft. 42 In. simple span viaduct over Patapsco River and 3 span bridge, Patapsco Tunnel Proj., MARYLAND. State Rds. Comn., 108 E. Lexington St., Baltimore 2, Md. Bids Dec. 8, CD 11/23.
Buckley & Co., Inc., 1317 S. Juniper St., Phila., Pa. LB $3,750,968. Contr. PT-105, 1.48 mi. south approach expressway incl. 4 steel bridges, 3 concrete box culverts (Maryland).

▲ **C. J. Langenfelder & Son**, 8427 Pulaski Hy., Baltimore 24, Md. CA $5,137,016. Contr. PT-101, 2.803 mi. south approach expressway, incl. 8 bridges and 3 concrete box culverts; CA $3,732,761, Contr. PT-120 section of north approach expressway 0.6 mi., incl. 8 overpasses and underpasses and connecting ramps, Patapsco Tunnel Proj., MARYLAND. State Rds. Comn., 108 E. Lexington St., Baltimore 2, Md. Grand total $11,230,513. CD 11/21, under LB;
Jos. F. Hughes Co., 5 W. Franklin St., Baltimore 1, Md. CA $2,360,736. Contrs. PT-111-113 combined Fairfield and Canton ventilation bldgs., Patapsco Tunnel Proj. (Maryland).

▲ **C. J. Langenfelder & Son**, 8427 Pulaski Hy., Baltimore 24, Md. CA $5,532,333. Contr. PT 106 approach expressway incl. 10 span bridge over B. & O. R.R. yards, 987 ft. span bridge over same, 207 ft., 4 span over Frankfurst Ave. and 466 ft. 8 span bridge, Patapsco Tunnel Proj., MARYLAND. State Rds. Comn., 108 E. Lexington St., Baltimore 2, Md. CD 11/14, under LB.

▲ **C. J. Langenfelder & Son**, 8427 Pulaski Hy., Baltimore 24, Md. CA $2,541,689. Contr. PT-102, 1.583 mi. west approach incl. 4 bridges drainage, interchanges, Patapsco Tunnel Proj., MARYLAND. State Rds. Comn., 108 E. Lexington St., Baltimore 2, Md. CD 11/25, under LB.

BUILDINGS—LB & CA

▲ **Planet Constr. Corp.**, 11 W. 42 St., New York 36, N. Y. LB $1,315,000. (5 bidders) general constr. PUBLIC SCHOOL 50, Adelaide Ave. between Clawson and Platts Sts., Oakwood, Richmond Boro, NEW YORK. Director, Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Dec. 9. CD 11/16.

▲ **The Foundation Co.**, 57 William St., New York, N. Y. CA Total est. cost. $8,000,000. switch yard and TRANSFORMER STATION, CORONA, N. Y. Consolidated Edison Co., 4 Irving Pl., New York 3, N. Y. CD 12/2/54.

▲ **Oakwood Park Homes**, c/o Stanley H. Klein, 89-31 161 St., Jamaica, N. Y. Owner Builds. $1,300,000. 70 HOUSES on tract at Jericho Turnpike and Robbins Lane, JERICHO, N. Y.

▲ **Eden Ridge Homes, Inc.**, c/o Bonded Realty Corp., Sunrise Hy., Lindenhurst, N. Y. Owner Builds. $4,500,000. 348 HOUSES on tract on Sunrise Hy., east of Wellwood Ave., LINDENHURST, N. Y.

▲ **Hudson Gardens Apartments**, c/o Julius Fishkind & Joseph S. Riggio, 161-19 Jamaica Ave., Jamaica, N. Y. Owner Builds. $1,500,000. three 6 story APARTMENTS, Church St. between Pelham Rd. and Union St., NEW ROCHELLE, N. Y.

▲ **Maple Woods Homes**, c/o Seymour Orlofsky, 199 Main St., White Plains, N. Y. Owner Builds. $4,000,000. 130 HOUSES on 47 acre tract at Hutchinson River Parkway and Wilmot Rd., NEW ROCHELLE, N. Y.

▲ **Anthony Campagna**, 654 Madison Ave., New York 21, N. Y. Owner Builds. Est. $1,650,000. 17 story APARTMENT, Third Ave. and 77 St., NEW YORK, N. Y. Sylvan & Robt. Bien, 33 W. 46 St., New York 19, N. Y., archts.

▲ **Planet Constr. Corp.**, 11 W. 42 St., New York 36, N. Y. LB $2,673,000 (2 bidders) general constr., Junior High SCHOOL, 143 W. 231 St., Sedgwick Ave. and Kingsbridge Terrace, Bronx Boro, NEW YORK, N. Y. Director, Bureau Constr., 4215 Crescent St., Long Island City 1, N. Y. Bids Dec. 8, CD 11/11.
Dropkin Bros., Inc., 205 Bedford Ave., Brooklyn, N. Y. LB $388,300 (5 bidders) electrical work. (New York, N. Y.).

▲ **Maran Constr. Co., Inc.**, 1910 Arthur Ave., New York 57, N. Y. LB $2,409,000 (8 bidders) general constr., Junior High SCHOOL, 141, W. 236 and 237 Sts. and Independence Ave., Bronx Boro, NEW YORK, N. Y. Director Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Dec. 7, CD 11/11.
Simpson Electric Corp., 71 E. 116 St., New York 29, N. Y. LB $356,400 (4 bidders) electrical work. (New York, N. Y.).

▲ **Lenard Homes**, c/o John Burton, archt., 163-18 Jamaica Ave., Jamaica, N. Y. Owner Builds. $2,500,000. 84 HOUSES on 28 acre tract at Jericho Turnpike and Woodland Gate, SYOSSET, N. Y.

▲ **Ocean Lea Homes**, c/o Lane Realty, 107-40 Queens Blvd., Forest Hills, N. Y. Owner Builds. $1,700,000. 100 HOUSES on tract at Fulton and Vermont Aves., OCEANSIDE, N. Y.

▲ **Depot Constr. Corp.**, 42-15 Crescent St., Long Island City, N. Y. CA $8,300,000. general contract MEDICAL-SURGICAL BLDG., DINING AND KITCHEN BLDGS. and connecting corridors, Creedmoor State Hospital,

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	Middle West
Middle Atlantic	West of Mississippi
South	Far West

PROPOSED WORK

Water Supply	Public Buildings
Sewers, Waste Disposal	Mass Housing
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

QUEENS VILLAGE, N. Y. Bureau Contracts & Accounts, The Gov. Alfred E. Smith State Office Bldg., Albany, N. Y. Grand total $10,720,000. CD 10/22, under LB.
Raisler Corp., 129 Amsterdam Ave., New York 23, N. Y. CA $752,000. heating work (Queens Village, N. Y.);
Heckler Electric Co., 44 Schenectady Ave., Brooklyn, N. Y. CA $932,200. electrical work (Queens Village, N. Y.).

▲ Turner Constr. Co., 420 Lexington Ave., New York, N. Y., CA, $2,000,000, 1 story transisters mfg. FACTORY, SOMERVILLE, N. J. Radio Corp of America, Tube Div., Camden, N. J. Malcom B. Wells, 122 Haddon Ave., Collingswood, N. J., archt.

▲ Moyer Brothers, 2605 Beale Ave., Altoona, Pa. LB $4,249,000. general constr. REHABILITATION CENTER, JOHNSTOWN, PA. General State Auth., 18 and Herr St., Harrisburg, Pa. Bids Dec. 14. CD 11/4;
Harry Dougherty & Son, Inc., 106 Fifth St., Freeport, Pa. LB $1,440,000. heating work (Johnstown, Pa.);
Williard, Inc., Germantown and Sedgley Ave., Phila. 33, Pa. LB $835,490. plumbing work (Johnstown, Pa.);
Reese & Bernard Electric Co., 132 Park Place, Johnstown, Pa. LB $714,000. electrical constr. (Johnstown, Pa.).

▲ W. O. Kessel Contr. Co., Butler Bldg., Bradford, Pa. CA Est. $1,500,000. 1 story, steel WAREHOUSE, PORT ALLEGANY, PA. Pittsburgh Corning Co., Port Allegany, Pa.

▲ Sessinghaus & Ostergaard, 1115 Peach St., Erie, Pa. CA Total est. $20,000,000. superstructure POWER PLANT addn., turbine and boiler rooms, incl. constr. of installation of 125,000 KW unit boiler and turbine, SEWARD, PA. Pennsylvania Electric Co., 222 Livergood St., Johnstown, Pa. Gilbert Assoc., Inc., 607 Washington St., Reading, Pa., engr. CD 9/9/54.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
January 4 Louisiana

▲ Va., Occoquan — BA 1/9 — American Water Works Service Co., Inc., 3 Penn Plaza, Phila. 2, Pa. concrete gravity dam on Occoquan Creek, incl. intake works, powerhouse, (1) approx. 45,000 cu. yd. concrete (2) approx. 9,000 cu. yd. rock and earth excav. in dam (3) pressure grouting in rock (4) access roadway. $1,500,000. Plans deposit $50.

▲† La., Alexandria—PAVING—BA 1/13—U. S. Eng., P. O. Box 867, Little Rock, Ark., 11 in. concrete overlay pavement; 17 in. new rigid pavement ,using approx. 49,000 cu. yd. conc.; b. conc. ramp, approx. 7,000 tons hot b. conc.; approx. 1,000 lin. ft. 42- to 54-in. storm drains; water distr. lines and fire hydrants, approx. 1,700 ft.; dust and erosion control, ENG-03-050-56-46, England Air Force Base. $1,000,000-$3,000,000. Extended date. CD 12/9.

HEAVY CONSTRUCTION—LB & CA

▲† Standard Dredging Corp., 6201 France Rd., New Orleans, La., CA, $3,364,350, est. $2,993,767 (5 bidders) dredging approx. 36½ million cu. yd. material from Mobile Ship Channel ALABAMA. U. S. Eng., 2301 Grant St., Mobile, Ala.. Bids Dec. 2, awarded Dec. 9. CD 11/14.

▲† Atlantic, Gulf & Pacific Co., 15 Park Row, New York, N. Y., CA $1,500,000. dredging work in Memphis Harbor, Memphis, Shelby Co., TENNESSEE. U. S. Eng., P.O. Box 97, Memphis 1, Tenn. Bids Nov. 16, awarded Dec. 8.

BUILDINGS—LB & CA

▲ Fluor Corp., Box 510, Whittier, Calif. CA Est. $4,350,000. design and construct butadiene PLANT, LAKE CHARLES, LA. Petroleum Chemicals, Inc., (Continental Oil Co. & Cities Service Co.), Lake Charles, La.

▲ Tennessee Products & Chemical Corp., 500 American Natl. Bank Bldg., Nashville, Tenn. Own Forces. $2,500,000. PLANT for production of ferromanganese. ROCKWOOD, TENN. CD 10/28.

MIDDLE WEST

BUILDINGS—SLC

▲ Mich., Saginaw—Y. M. C. A. BLDG.—Young Men's Christian Assn., 200 N. Michigan St., soon lets contract. Y. M. C. A. bldg. $1,500,000. Frantz & Spence, 326 N. Washington St., archts. CD 11/7/53.

HEAVY CONSTRUCTION—LB & CA

▲ OHIO—State Hy. Dpt., Columbus, Zone 15,
O.—C. F. Replogle Co., 122½ N. Court St., Box 308, Circleville, O., CA $3,161,717, est. $3,429,500, Type T-71 and structures 6.37 mi. U. S. R. 23. Sect. 7.26 F-460 (6), Pickaway Co.;
O.—A. J. Baltes, Inc., 11 Olive St., Norwalk, O. CA $1,564,816, est. $1,703,700, Type T-71 and structures 5.98 mi. U. S. R. 21, Sect. 5.90, Guernsey Co. Bids Nov. 29. CD 12/6, under LB.

▲ OHIO—State Hy. Dpt., Columbus, Zone 15,
O.—F. Replogle Co., 122½ N. Court St., Circleville, O., CA $1,666,669, est. $1,886,000. Type T-71 and structures 4.158 mi. S. R. 4, Sections (16.53-19.15) F-581 (10), Butler Co.;

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Layne & Bowler engineers have designed the Verti-Line Turbine Pump to strike a balance between first cost and operating cost—to give the owner most for his pumping dollar for years and years.

balanced efficiency

With a Verti-Line, you get sustained, high wire-to-water efficiency, plus wide efficiency spread for "off-peak" conditions . . . Efficiency which results from sound engineering and the highest possible standards of manufacturing quality control.

balanced operation

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O.—**Peter Kiewit Sons' Co.**, 15806 Lorain Ave., Cleveland, O., CA $923,353, est. $1,086,500, Type T-35 and structure 11.931 mi. S. R. 15, Section (2.53-5.84) (6.50) (8.47-15.22) Williams Co., Bids Nov. 22. CD 11/30 under LB.

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,

O.—**V. N. Holderman & Sons, Inc.**, 890 Oakland Park Ave., Columbus, O. LB $3,566,178, est. $4,199,000. (7 bidders) Type T-71 and structures 9.375 mi., USR 25-12.99, IN-1067 (1), city of Findlay, Hancock Co.;

O.—**D. R. Smalley & Sons, Inc.**, 436 W. Market St., Celina, O. LB $4,845,910, est. $5,302,000. (7 bidders) Type T-71 and structures 13.112 mi., USR 25-4-29, IN-196 (3), city of Troy, Miami Co.;

O.—**Arthur S. Langenderfer, Inc.**, 4690 W. Bancroft St., Toledo, O. LB $485,387, est. $519,600. (3 bidders) Type T-35 6.189 mi., SR 199-(6.02-11.05), S-660 (6), village of Rising Sun, Sandusky-Seneca-Wood Counties, Wood Co.;

O.—**The Walt Kunz Co.**, P. O. Box 1537, Cincinnati, O. LB $363,050, est. $421,500. (7 bidders), Type T-35 and T-71 1.135 mi., SR 74-0.00, 12.65, Clermont and Hamilton Counties;

O.—**W. E. Ringwald**, 42 E. Second St., Chillicothe, O. LB $1,415,285, est. $1,575,900. (3 bidders), Type (Pt. 1) T-35 and T-71 (Pt. 2) T-35 and T-71 and structure 4.969 mi., USR 23-(12.80-12.94), (13.92-17.48) Parts Nos. 1 and 2, Delaware Co.;

O.—**Smith Constr. Co. of Ohio**, P. O. Box 515, Vienna, O. LB $392,979, est. $484,900. (2 bidders), Type T-35 T-71 and structure 0.801 mi., SR 164-13.80, city of Youngstown, Mahoning Co.;

O.—**Rome Daugherty**, Glenford, O. LB $77,875, est. $79,000. (4 bidders), Type T-35 and structure 0.208 mi., SR 113-14.88, Seneca Co.;

O.—**Oyler Brothers, Inc.**, 1324 Second St. S. W., Canton, O. LB $1,793,215, est. $2,071,500. (8 bidders) Type T-35, T-71 and structure 6.549 mi., USR 62-22.16, Stark Co.;

O.—**D. W. Winkelman Co., Inc.**, 205 Harrison St., Syracuse, N. Y. LB $2,667,134, est. $2,817,800. (7 bidders), Type T-35 on B-70 and structures 1.264 mi., SR 18R-12.90 Part No. 7, city of Akron, Summit Co. Bids Dec. 6. CD 11/21.

▲† **Mayfair Constr. Co.**, 5660 N. Kedzie St., Chicago, Ill., LB, $1,555,891, Army Anti Aircraft installation, near Gary, Lake Co., INDIANA. U. S. Eng., 475 Merchandise Mart, Chicago 54, Ill. Bids Nov. 30. CD 10/27.

▲ **Traylor Bros., Inc.**, Upper Mt. Vernon Rd., Evansville, Ind., CA, $528,000. Pleasant Run interceptor sewers, east branch; CA $2,412,000 Alder-McCarty interceptor; CA $2,192,000 Lick Creek interceptor 3rd Section; CA, $750,000. Fall Creek interceptor, Meridian Hills Exten. Section A; CA $929,000. Section B, INDIANAPOLIS, IND. Bd Sanitation, 421 N. Penn. St., Indianapolis, Ind. Grand total $10,253,325. Bids Nov. 21, awarded Dec. 5. CD 11/3 and 11/2;
H. D. Tousley & Co., 925 E. St. Clair St., Indianapolis, Ind., CA, $1,825,000. Section 1, Lick Creek Interceptor Sewers (Indianapolis, Ind.);
Thompson Constr. Co., 3840 Prospect St., Indianapolis, Ind., CA, $1,042,325, Section 2, Lick Creek Interceptor (Indianapolis, Ind.);
Smith & Jacksen Constr. Co., 1799 Kentucky Ave., Indianapolis, Ind., CA, $575,000. Arlington Exten. of Fall Creek Interceptor Sewer. (Indianapolis, Ind.)

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Sargent Constr. Co., 2840 Bay Rd., Saginaw, Mich. LB $1,712,471, est. $1,900,000. (10 bidders) c. conc. 6 mi. US-131 from 76 St. north to 28 St., F 41-88 C1-RO (F 140 16), Kent Co. Bids Dec. 7. CD 11/25.

BUILDINGS—LB & CA

▲ **Westinghouse Electric Corp.**, P.O. Box 868, Pittsburgh 30, Pa. CA TURBO-GENERATOR for Avon Power Plant addn., AVON LAKE, O. Total est. $38,000,000. Cleveland Electric Illuminating Co., Public Square, Cleveland, O.;
Combustion Engineering Co., 208 Madison Ave., New York, N. Y. CA boiler. (Avon Lake, O.).

▲ **George Zane Constr. Co.**, 4248 Pearl Rd., Cleveland 9, O. Own Forces. $6,600,000. 300 HOMES, BROADVIEW HEIGHTS, O.

▲ **A. Bentley & Sons Co.**, 201 Belmont Ave., Toledo, O. CA Est. $4,000,000, design and construct 140,000 sq. ft. bumper PLANT addns. incl. 2 bldgs., SHARONVILLE, O. Electric Auto-Lite Co., Champlain St., Toledo, O. CD 12/8.

▲ **A. Bentley & Sons Co.**, 201 Belmont St., Toledo, O. Own Forces. $2,000,000. FACTORY addn., Bennett Rd., TOLEDO, O. Dana Corp., 4100 Bennett Rd., Toledo, O. CD 11/30.

▲ **James McHugh Constr. Co.**, 6449 S. Park Ave., Chicago, Ill., CA, $5,789,000, HIGH SCHOOL, sewer connections and boiler room, BERWYN, ILL. Morton High School Assn., 2423 S. Austin Blvd., Cicero, Ill. Awarded Dec. 9. CD 11/15, under LB.

▲ **McCarthy Bros. Constr. Co.**, 4903 Delmar Blvd., St. Louis 3, Mo., CA $1,600,000 general contract 1, 2, 3 and 4 story bsmnt., 100-bed HOSPITAL, NURSES QUARTERS, CHAPEL, BOILER ROOM, etc. CENTRALIA, ILL. St. Mary's Hospital, Centralia, Ill. Bids Sept. 15, awarded Dec. 8. CD 9/27, under LB;
Fowler Plumbing & Heating Co., 217 E 2 St., Centralia, Ill., CA $850,000. mechanical work (Centralia, Ill.).

▲ **Aldridge Constr. Co.**, 1902 W. Monterey St., Chicago, Ill., Own Forces, $2,500,000. 250 HOMES, MATTESON, ILL.

▲ **Fred C. Rowley & Son**, 4732 Calumet St., Hammond, Ind., CA, $2,536,000. Thornton Fractional Twp. HIGH SCHOOL, THORNTON, ILL. School Dist. 215, Pulaski Rd. and Superior Ave., Calumet City, Ill. Bids Nov. 16, awarded Dec. 8. CD 11/11.

▲ **Fidelity Development Co.**, 4214 N. Western St., Chicago, Ill. Own Forces. $8,000,000. 400 HOMES, NILES, ILL.

▲ **Inland Constr. Co.**, 134 N. La Salle St., Chicago 2, Ill., CA, $5,000,000. STORE in Old Orchard Shopping Center, SKOKIE, ILL. Fair Store, State and Adams Sts., Chicago 3, Ill. Awarded Dec. 6. CD 11/28.

▲ **J. F. Arman & Co.**, 13500 S. Crawford Ave., West Robbins, Ill., Own Forces, $8,100,000. 800 HOMES, WEST ROBBINS, ILL. M. J. McCarthy, 6201 S. Washtenaw St., Chicago, Ill., archt.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES

December 29 Kansas — January 5 Missouri
January 10 South Dakota — January 11 Texas

STREETS AND ROADS

December 29 Kansas — January 25 Missouri
January 10, 11 Texas

▲ **Tex., Dallas** — WIND TUNNEL — BA 1/3 — Chance Vought Aircraft, Inc., 9314 W. Jefferson St., wind tunnel, at Grand Prairie. $3,500,000. CD 12/9.

BUILDINGS—SLC

▲ **Kan., Atchison**—RESIDENT HALL—Mount St. Scholastica College, c/o Benedictine Sisters, Atchison, soon let contract, resident hall and student activity bldg., $1,500,000. Maguolo & Quick, 4908 Delmar St., St. Louis, Mo., archts. CD 9/28.

HEAVY CONSTRUCTION—LB & CA

▲† **List & Clark Constr. Co.**, Railway Exchange Bldg., Kansas City, Mo. LB $4,238,094, est. $4,346,925. excav. spillway and constr. of embankment Stage III Tuttle Creek Dam and Reservoir, clearing, grubbing, excav. spillway, embankment installment of piezometers and settlement gages, grouting, restoration and alteration of constr. bridge, near Manhattan, Riley Co., KANSAS. U. S. Eng., 1800 Federal Office Bldg., Kansas City, Mo. Bids Dec. 8. CD 11/9.

▲ **United Builders**, Shawnee, Okla., CA $1,564,000. dock and warehousing work, BEAUMONT, TEX. Port of Beaumont, c/o Port Commission, 1255 Main St., Beaumont, Tex. Bids Nov. 29. CD 12/13, under LB.

BUILDINGS—LB & CA

▲ **Parsons Constr. Co.**, 2512 Deer Park Blvd., Omaha, Neb., CA $2,454,656. general constr. OFFICE, OMAHA, NEB. Northwestern Bell Telephone Co., 19th and Douglas Sts., Omaha, Neb, Bids Nov. 29;
Grunwald, Plumbing Co., 1110 Farnam St., Omaha, Neb., CA $857,800, mechanical (Omaha, Neb.)

▲ **Henger Constr. Co.**, Dallas Natl. Bank Bldg., Dallas, Tex., CA $2,363,000. furniture mfg. PLANT CA $215,000. products WAREHOUSING, ATHENS, TEX. Olive-Myers-Spalti Mfg. Co., 2220 Young St., Dallas, Tex. CD 4/14.

▲ **George A. Fuller Co.**, Gibraltar Life Bldg., Dallas, Tex., CA $1,706,275. 8 story CLINIC SCIENCE BLDG. DALLAS, TEX. Southwestern Medical School, University of Texas, Main Bldg. 104, Austin, Tex. Bids Nov. 29. CD 12/5, under LB.

▲ **Walsh & Burney Co.**, 928 N. Flores St., San Antonio, Tex., LB $6,569,722. 20 story BANK and OFFICE, SAN ANTONIO, TEX. National Bank of Commerce, Soledad and Travis Sts., San Antonio, Tex. Bids Dec. 13. CD 11/21.

▲ **Mead & Mount**, 1560 Denver Club Bldg., Denver, Colo., LB, $1,647,000 general contract Dorothea Kunsmiller Junior High SCHOOL in Harvey Park, DENVER, COLO. School Dist. No. 1, 414 14 St., Denver, Colo. Bids Dec. 7. CD 11/14.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
January 11, 12 California

HEAVY CONSTRUCTION—BA

▲† **Calif., Sacramento**—HANGAR, etc.—BA 1/12—U. S. Eng., 1209 8 St., Sacramento, hangar, deluge sys. fire station, paving and utilities, ENG-04-167-56-30. $3,000,000. CD 6/6/52.

BUILDINGS—BA

▲ **Calif., Covina**—HIGH SCHOOL—BA 1/5—Covina School Dist., Covina, 132,800 sq. ft., frame, stucco high school, $2,000,000. Kistner, Wright & Wright, 816 W. 5 St., Los Angeles, archts. CD 4/26.

HEAVY CONSTRUCTION—LB & CA

▲† **W. E. Kier Constr. Co.**, El Segundo, Calif., and **Haddox & Fisher**, Yuma, Ariz., LB, $3,154,653, est. $2,736,583, Palo Verde Diversion Dam and levee sys., Palo Verde Diversion Proj., Spec. DC 4551, ARIZONA and CALIFORNIA. Bureau Reclamation, Dpt. Interior, Blythe, Calif. Bids Dec. 6. CD 11/1.

▲† **Morrison-Knudsen Co.**, 319 Broadway, Boise, Idaho, LB, $2,093,754, est. $1,946,469 (5 bidders) relocation Northern Pacific Ry. tracks at Kanasket on Eagle Gorge Dam, CIVENG-45-108-56-20, WASHINGTON. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Dec. 13. CD 12/6.

▲† **Gunther & Shirley Co.**, P. O. Box 1037, Sherman Oaks, Calif. and **E. V. Lane Corp.**, 2675 Park Blvd., P. O. Box 417, Palo Alto, Calif., CA $3,195,782, powerhouse equipment, The Dalles Dam, Wasco Co. CIVENG-35-026-56-60, OREGON. U. S. Eng., Pittock Block, Portland, Ore. Bids Dec. 1, awarded Dec. 8. CD 12/5, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N. St., Sacramento,

American Bridge Div., U. S. Steel Corp., 564 Market St., San Francisco, Calif., CA, $9,489,126, steel superstructure of parallel Carquinez Bridge, incl. two 1,100 ft. main cantilever spans, two 500 ft. and anchor spans, one 150 ft. center tower span and structural steel girder approach span to provide 52 ft. clear roadway, Contra Costa and Solono Counties. Bids Nov. 30. CD 12/2, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,

Ferry Bros., John M. Ferry, Peter L. Ferry and Son, L. A. and R. S. Crow, 5201 San Fernando Rd., Glendale, Calif., CA $7,098,690, 6-lane 2.9 mi. divided freeway, 2 overcrossings and 3 undercrossings etc. part of Caruquinez Twin Bridge and approaches Contra Costa Co. Bids Nov. 28. CD 11/30, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,

Peter Kiewit Sons Co., 442 Post St., San Francisco, Calif., CA, $4,661,462, parallel Carquinez Bridge approach and Crockett Interchange, Contra Costa Co. Bids Dec. 1. CD 12/5, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,

McCammon & Wunderlich, 2555 Pulgas Ave., Palo Alto, Calif., CA $6,933,498 freeway 4.9 mi., 5 rein.-con. bridges on realigned routing U. S. 40 and between 0.1 mi. south of Hilltop Dr. and 0.8 mi. north of Hercules, Contra Costa Co. Bids Dec. 7. CD 12/9, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St. Sacramento,

Mason & Harnger, Silas Mason Co., Inc., and F. S. Rolandi, Jr. Inc., 599 Front St., San Francisco, Calif., CA, $5,454,693, parallel Carquinez Bridge substructure and rein.-con. abutments and piers, Contra Costa and Solano Counties. Bids Nov. 29. CD 12/1, under LB.

▲ **Morrison-Knudsen Co.**, 319 Broadway, Boise, Idaho,
Walsh Constr. Co., 785 Market St., San Francisco, Calif. and **B. Perini & Sons**, 73 Montwait Ave., Framingham, Mass., CA 290 ft. high, 840 ft. long Helms Dam on Kings River, CALIFORNIA. Pacific Gas & Electric Co., 245 Market St. San Francisco, Calif. CD 11/9.

▲ **Ukropina-Polich-Kral & Baker Anderson Corp.**, 201 E. Las Tunas Dr., San Gabriel, Calif., LB $1,541,262. (8 bidders) West Orange County Feeder extension, Orange, LOS ANGELES, CALIF. Metropolitan Water Dpt. of Southern Calif. 306 W. 3 St., Los Angeles,

BUILDINGS—LB & CA

▲ **S. Morgan Smith**, York, Pa., CA, $2,700,000. 28 hp. turbine for Snoqualmie Fall Sound PLANT No. 2, SNOQUALMIE FALLS, WASH. Puget Sound Power & Light Co., Electric Bldg., Seattle 1, Wash. CD 11/30.

▲ **Theo. G. Meyer & Sons Constr. Co.**, 200 Quint St., San Francisco, Calif., CA, $2,358,255. Westmoor SCHOOL, DALY CITY, CALIF. Jefferson Union High School Dist., Daly City, Calif. Bids Dec. 8 CD 12/9, under LB.

▲ **McDonald Bros.**, 2639 S. La Cienega Blvd., Los Angeles, Calif., LB, $2,422,753, Watts Junior High SCHOOL, LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Dec. 14. CD 11/21.

▲ **Lawrence Constr. Co., Campbell Constr. Co., Erickson Constr. Co. & Continental Constr. Co.**, 4671 24 St. Road, Sacramento, Calif., CA, $2,047,585. 3 story 98-bed general HOSPITAL, 52 and F Sts., SACRAMENTO, CALIF. Sutter Community Hospitals, 2820 L St., Sacramento, Calif. CD 10/10.

▲ **M & K Corp.**, 405 Montgomery St., San Francisco, Calif., CA $1,601,698, 6 story OFFICE. for Dpt. Veterans Affairs SACRAMENTO, CALIF. State Div. Architecture, P. Wks. Bldg., Sacramento, Calif. Bids Dec. 6. CD 11/9.

▲ **Fluor Corp.**, Box 150, Whittier, Calif., CA $2,400,000. design and construct 60,000 kw steam electric GENERATING PLANT (first unit), SAN BERNARDINO, CALIF. California Electric Power Co., 3771 W. 8 St., Riverside, Calif. CD 11/21.

CANADA

BUILDINGS—BA

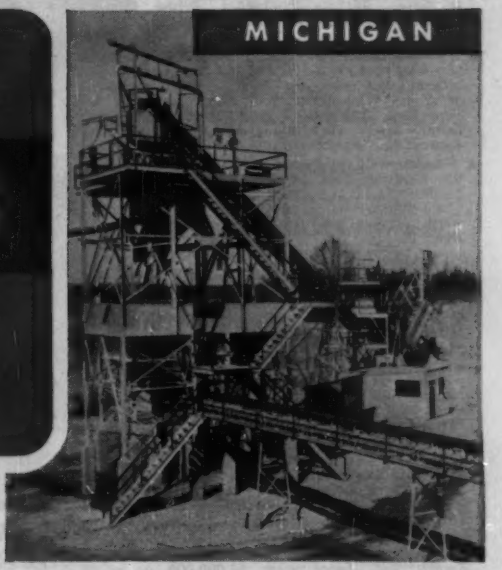
▲ **Alta., Calgary**—OFFICE—BA 1/5—Canadian Western Natural Gas Co., Calgary, 6 story, steel, rein.-con. office addn. $1,500,000. J. Stevenson & Assocs., 340 7 Ave. W., archts. CD 12/14.

HEAVY CONSTRUCTION—LB & CA

▲ **Marine Pipeline & Dredging Co.**, 740 W. Hastings St., Vancouver, CA $6,000,000, 41 mi. natural gas pipe line from Anacortes, Wash., U. S. A. to Vancouver

(Continued on page 46)

modern AGGREGATE PLANTS by TELSMITH



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(Continued from page 44)

Island between Saanich and Oak Bay, BRITISH COLUMBIA and WASHINGTON, U. S. A. Magna Pipeline Co. Ltd., 508 Credit Foncier Blvd., Vancouver, B. C. B. D. Bohna & Co. Ltd., 1070 Hornby St., Vancouver, B. C., engrs. Awarded Dec. 7.

▲ **BRITISH COLUMBIA**—B. C. Govt., Parliament Bldgs., Victoria,

Western Bridge & Steel Fabricators Ltd., 145 W. 1 St., Vancouver, B. C., LB, $1,343,621 fabrication and erection of steel superstructure for Nelson Bridge over west army of Kootenay Lake, Nelson. Bids Nov. 30. CD 11/15.

▲ **Mannix Ltd.**, 736 Granville St., Vancouver, B. C., CA $3,000,000, 36 mi. 18 in. diam. natural gas pipe line from Huntington to south of Pattullo bridge in Surrey, BRITISH COLUMBIA. British Columbia Electric Co., 425 Carrall St., Vancouver, B. C. Awarded Dec. 6.

▲ **Terminal Constr. Co. Ltd.**, Dominion Square Bldg., Montreal, Que., CA, $2,735,940, construction and completion of recreational bldg., skating rink, ration depot and telecommunications bldg., Goose Bay Air Force Base, GOOSE BAY, NEWFOUNDLAND, Defense Constr. (195) Ltd., 56 Lyon St., Ottawa, Ont. Awarded Nov. 30.

▲ **Foundation Co. of Canada Ltd.**, 1900 Sherbrooke St. W., Montreal, Que., CA $1,857,721 wharf exten. on Sections 58 to 61, Montreal Harbor, MONTREAL, QUE. National Harbor Bd., West Block, Parliament Bldgs., Ottawa, Ont., Awarded Nov. 30. CD 10/28, under LB.

BUILDINGS—LB & CA

▲ **Canadian Western Lumber**, Fraser Mills, B. C., Owner Builds, $3,500,000, modernizing, extending operation of SAWMILL div. and constr. barking PLANT, FRASER MILLS, B. C. Awarded Dec. 2.

▲ **Canadian Machinery & Industry Constr. Ltd.**, Topsail Rd., St. John's, Newfoundland, CA Total est. $1,500,000. substructure and steel supply only for HOME for the AGED and chapel, Elizabeth Ave. and Long Pond Rd., ST. JOHN'S NEWFOUNDLAND, Roman Catholic Episcopal Corp., St. Johns' Newfoundland, John E. Hoskings, 91 Waterford Bridge Rd., archt. Awarded Dec. 1. CD 12/54, under LB.

▲ **Brookfield Constr. Co., Ltd.**, 32 Inglis St., Halifax, N. S., CA, Est. $2,200,000. 215 D.N.D. HOUSING UNITS, At Army Camp, Camp Gagetown, FREDERICTON, N. B. Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont. Bids Dec. 20. CD 12/2.

▲ **Principal Investments Ltd.**, 133 Richmond St. W., Toronto, Ont., Owner Builds, $2,000,000. 20 to 25 store SHOPPING CENTER, 16-acre site at Lansdowne St. and Monaghan Rd., PETERBOROUGH, ONT.

▲ **Jardins Pont Viau Ltd.**, Room 214, 5165 Sherbrooke St. W., Montreal, Que., Owner Builds. $5,000,000. HOUSING, off Levesque Blvd. in suburban St. Vincent de Paul, MONTREAL, QUE.

▲ **Reliance Constr. Co.**, 2205 Beaconsfield Ave., Montreal, Que., CA, $2,000,000, SHOPPING CENTER, suburban Cote St. Luc, MONTREAL, QUE. Ivanhoe Corp., 5400 Hochelaga St. and Ninety Five Investment Corp., 4060 St. Lawrence Blvd., Montreal, Que. Eliasoph & Berkowitz, 6931 Cote des Neiges Rd., Montreal, Que., archts. Awarded Dec. 6. CD 4/20.

▲ **Poole Constr. Co. Ltd.**, 10503 109 St., Edmonton, Alta., CA, $8,000,000. cement mfg. PLANT, REGINA, SASK. Saskatchewan Cement Corp. Ltd., Regina, Sask. CD 10/24.

ALASKA

HEAVY CONSTRUCTION—LB & CA

▲† **Pacific Alaska Contractors**, 1515 Center St., Tacoma, Wash., LB $1,784,228, est. $2,092,930, (8 bidders) 4 underground fuel storage tanks, Inv. 56-9, Elmendorf Air Force Base, ALASKA. U. S. Eng., Anchorage, Alaska. Bids Dec. 9. CD 12/1.

LATIN AMERICA

BUILDINGS—LB & CA

▲ **LAYCO, S. A. (L. Andreu & Co.)**, Calle Ruben Dairo No. 40, San Salvador, El Salvador, CA $2,728,400. National MEDICAL CENTER, SAN SALVADOR, EL SALVADOR. Proveeduria Especifica de Obras Publicas, San Salvador, El Salvador. CD 8/20/53.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

▲† **Sanford Constr. Co.**, 161 Lockland Ave., Winston-Salem, N. C., and **Markowitz Bros.**, 5600 E. 4 Ave., Miami 37, Fla. LB Approx. $4,500,000 (4 bidders) POL storage and distr. sys. at Rota, Moron, Torrejon and Zaragoza for Bureau Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N. W., Wash. 25, D. C. U. S. Air Bases; SPAIN. Brown-Raymond-Walsh, Prime Contractors, Eng. Dpt., Edificio Espana, Madrid, Spain. Bids Dec. 7. CD 11/15.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Ill., Galesburg**—City, City Hall, water supply sys. addns. $5,000,000. Casler & Stapleton, 313 W. State St., Jacksonville, consult. engrs.

▲ **Tex., Karnes City**—Karnes County Water District No. 1, Karnes City, large water main from reservoir and dam, above Karnes City on Cibolo Creek to Karnes City and Kenedy, $600,000; central water filtration plant, $375,000; daming Cibolo Creek above Karnes City for furnishing domestic and industrial waters to towns of Karnes City and Kenedy. $875,000.

▲ **Wis., Milwaukee**—City, City Hall, 30 m.g. concrete reservoir, S. 6 St., $1,600,000, 10 mi., water mains, $925,000. Lloyd Knapp, city engr.

▲ **Ont., Hamilton**—Steel Co. of Canada Ltd., Wilcox St., 207,000,000 gal. per day pumping station. $1,000,000.

SEWERS, WASTE DISPOSAL

▲ **Tex., San Antonio**—City, City Hall, voted bonds Nov. 29, sanitary sewers, $2,250,000; storm sewers, $2,750,000. CD 11/10.

▲ **W. Va., Weirton**—City, City Hall, sewage treatment plant and interceptor sewers. $3,000,000. CD 8/11/50.

STREETS AND ROADS

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,
INNER BELT FREEWAY
Cuyahoga Co.—shoreway to Superior Ave., $14,000,000. Bids about March 1956.
Superior to Cedar Ave., $12,000,000. Bids about July 1956.
bridge approaches, $13,000,000. Bids about July 1956.
Central interchange, first phase, $13,000,000. Bids about July 1957.
Central interchange, final phase, $10,000,000. Bids about July 1958. Howard Needles, Tammen & Bergendoff, 55 Liberty St., New York, N. Y., consult. engrs. S. D. Linzell, dir. Hys.

▲ **Tex., Galveston**—Galveston Co., Court House, defeated $3,450,060 bonds Dec. 3, extensive road and bridge imprvs. CD 10/28.

▲ **Tex., San Antonio**—City, City Hall, voted bonds Nov. 29, street imprvs., paving. $3,952,000. CD 11/10.

▲ **Ont., Toronto**—Municipality of Metropolitan Toronto, 67 Adelaide St. E., 6-lane, 8-mi. long dual expressway along Don Valley, major unit of Don Valley Parkway, $23,504,000; 4-lane extension of Bayview Ave., to supplement Don Valley Park, $2,790,000; Lawrence Ave. imprv. to make it a major feeder artery into Don Valley Parkway $1,330,000; 3 lots parking facilities along Don Valley Parkway to keep cars out of downtown area $300,000; Keating St. Subway part of Don Valley Parkway development, $750,000. Foundation Co. of Canada, Eng. Corp. Ltd. and Frederick R. Harris of Canada Ltd., 200 Bloor St. E., consult. engrs. CD 5/25.

EARTHWORK, WATERWAYS

▲ **California**—East Bay Municipal Utility Dist., 512 16 St., Oakland, plans long-range program to be completed in 1983 to develop water resources on Mokelumne River, incl.
Camanche Dam, $12,330,000.
Middle Bar Dam, $9,600,000.
Railroad Flat Dam, $23,500.
Pardee Dam, crest dates, $1,100,000.
third aqueduct, third pumping station and second tunnel at Walnut Creek, $47,107,000. Total est. $93,637,000.

▲† **Calif., Sacramento**—Sacramento Municipality Utility Dist., 21 and K Sts., voted bonds Dec. 6, 4 powerhouses to generate about 200,000 kw, three major dams, 7 smaller diversion dams, tunnels, transmission lines and access roads, Upper American River, near here. $82,000,000. CD 9/8.

▲† **Georgia and South Carolina**—U. S. Eng., 200 E. St. Julian St., Savannah, Ga., bridge for relocation on U. S. Route 29, Savannah River Crossing, Hartwell Proj. vicinity of Hartwell, Ga. and Anderson, S. C. Parchen & Zimmerman, 525 Telfair St., Augusta, Ga., consult. engrs. CD 9/19.

▲ **Nova Scotia**—Province of N. S., Parliament Bldgs., Halifax, hydro-electric power development 1,050 ft. wide and 35 ft. high main dam, on each flank will be two 1,875 ft. long wing dams, Incl. 3,200 ft. pipe line, surge tank, 5,300 hp turbine generator, switching distribution equipment, Bear River. $1,500,000.

AIRPORTS

▲† **Ore., Pendleton**—GROUND ENVIRONMENT INSTALLATION—U. S. Eng., City-County Airport, Walla Walla, Wash., semi-automatic ground environment installation with 19-permanent type bldgs., for Air Force. $4,000,000.

▲ **Tex., San Antonio**—AIRPORT IMPRVS.—City, City Hall, defeated bonds Nov. 29, municipal airport imprvs. (Almo). $1,900,000. CD 11/10.

▲ **Wash., Tacoma**—AIRPORT—Port of Tacoma, Portacoma Rd., airport. $3,000,000.

LATIN AMERICA

▲ **Colombia, Bogota**—Hotel Tequendama, Bogota, plans hotel expansion. $1,000,000.

▲ **Venezuela, Caracas**—Hotel Tamanaco, (Intercontinental Hotels Corp., 135 E. 42 St., New York, N. Y. will manage), Caracas, plans hotel expansion. $1,000,000.

▲ **Venezuela, Maracaibo**—Hotel del Lago, Maracaibo, plans hotel expansion. $1,000,000.

AMERICANS ABROAD

▲ **Iran**—Govt. of Iran, Teheran, plans utilities, health centers, schools, agricultural colleges, hospitals, power plants and other facilities for development of southern Iran. Litchfield-Whiting-Panero Severud & Assocs., 292 Madison Ave., New York, N. Y. are engineer-architects. R. C. Smith will direct the seven year engineering program.

PUBLIC BUILDINGS

▲ **Calif., Beverly Hills**—GARAGES, etc.—City, City Hall, voted $5,000,000 bonds Nov. 22, garages, off-street parking lots, etc. CD 10/25.

▲ **Calif., Lafayette**—SCHOOLS—Acalanes Union High School Dist., 1200 Pleasant Hill Rd., voted $3,250,000 bonds, Mira Monte and Las Lomas Schools, Acalanes High School addns., and initial units for high school. CD 9/21.

▲ **Colo., Denver**—SCHOOLS—School District No. 1, 414 14 St., voted $28,500,000. bonds Dec. 6, four Senior High Schools, 5 Junior High and 5 Elementary Schools and 18 schools addns. CD 10/19.

▲ **D. C., Wash.**—DWELLINGS—National Capital Housing Auth., 1728 L St. N.W., plans by Holden Egan & Assoc., 1346 Connecticut Ave. N.W., 274 dwelling units, Benning Rd. and G St. S.E., DC-122, $2,568,000; plans by McLeod & Ferrara, 1200 18 St. N.W., Wash., D. C., 158 dwelling units, Hopkins Pl., 12, 13, L Sts. and Potomac Ave. S.E., $1,400,000.

▲ **Iowa, Des Moines**—SCHOOLS—Independent School Dist., 629 3rd St., voted $8,165,000 bonds, new schools and school imprvs. Wetherell & Harrison, 506 Shops Bldg., archts. CD 11/25.

▲ **Mich., Adrian**—SCHOOL—City, Bd. Educ., plans by Louis C. Kingscott & Assoc., 511 Monroe St., Kalamazoo, high school, Riverside, Budland and McKenzie Sts. $4,600,000; 2 story Junior High School addn., $793,000. CD 1/9/51.

▲ **N. Y., New York**—SCHOOL—Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, N. Y., plans by Ketchum, Gina & Sharp, 227 E. 44 St., New York, Zone 17, 3 story Junior High School 143, at 231 St. and Kingsbridge Terrace, Proj. E-927, Bronx Boro, $3,000,000.

▲ **S. D., Rapid City**—SCHOOL—Bd. Educ., 6 and Columbus Sts., voted $3,100,000 bonds Nov. 15, school imprvt. program. CD 9/21.

▲ **W. Va., Morgantown**—COURT HOUSE—Mongalia County Court, Court, House, plans by Robert J. Bennett, 427 Monongahela Bldg., court house, $2,000,000. CD 1/9/46.

▲ **Alta., Red Deer**—MENTAL HOSPITAL—Alberta Govt. Health Dpt., Parliament Bldgs., Edmonton, mental hospital. $8,000,000.

▲ **B. C., Prince George**—HOSPITAL—Prince George & District Hospital Society, Prince George, plans by Sharp & Thompson, Berwick, Pratt, 1553 Robson St., Vancouver, 150-bed hospital, $2,000,000.

▲ **Ont., Toronto**—OFFICE—Toronto Transit Comn., 35 Yonge St., plans by Charles B. Dolphin, 880 Bay St., 6 story, steel, stone, granite face office, over subway station and track at Davisville Ave. and Yonge St. $2,000,000.

▲ **Que., Montreal**—FEDERAL GOVERNMENT—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., plans by Lawson & Betts, 660 St. Catherine St. W., 10 story, 2 bsmnts., 437,000 sq. ft. structural steel, rein.-con., stone federal government bldg., Dorchester and Bleury Sts. $6,000,000. Vrouillet & Carmel, 3600 Barclay Ave., consult. engrs. CD 2/14.

COMMERCIAL BUILDINGS

▲ **Calif., Redding**—SHOPPING CENTER—Div-Commonwealth, Inc., Equitable Bldg., Portland, Ore., shopping center, incl. department store, supermarket shops, gasoline service station, Northgate Manor Development, $3,500,000. Clair Hill & Assocs., 1525 Court St., Redding, consult. engrs.

▲ **Calif., Sausalito**—HOME SUB-DIVISION—Leo Epp, 703 Market St., San Francisco, 200 home sub-division, $3,500,000.

▲ **Calif., Whittier**—HOSPITAL—Presbyterian Bd. Hospitals, c/o Daniel, Mann, Johnson & Mendenhall, archts., 4201 Sunset Blvd., Los Angeles, 100-bed Presbyterian Inter-Community Hospital, $2,000,000. J. Dewey Harnish, 222 E. "B" St., Ontario, consult. archt.

▲ **N. Y., New York**—OFFICE, etc.—Chase Manhattan Bank, 18 Pine St., Zone 15, plans by Skidmore, Owings & Merrill, 575 Madison Ave., office, parking garage, Liberty, William, Cedar and Nassau Sts., $75,000,000. CD 11/15.

▲ **N. Y., New York**—APARTMENT—999 Lexington Ave. Corp., 50 Broadway, Zone 4, plans by H. I. Feldman, 415 Lexington Ave., Zone 17, apartment 974-996 Lexington Ave. from 71 to 72 Sts. $1,800,000.

▲ **N. Y., New York**—APARTMENT—319 E. 72 St. Corp., 855 Sixth Ave., plans by H. Herbert Lilien, 201 W. 72 St., Zone 23, apartment 315-21 E. 72 St. $2,000,000. To go ahead in Spring 1956.

▲ **N. Y., Syracuse** — STORE — Hotel Syracuse, E. Onondaga-S. Warren Sts., plans by King & King, S. Warren St., store addn., remodeling present bldg. $2,000,000.

▲ **O., Cleveland Heights**—OFFICE, etc.—Longwood Estates, Paul Gilmore, pres., 3700 Mayfield Rd., Cleveland, Zone 21, development of 150 acre site at Mayfield and Taylor Rds. into 90 acres of park and office bldgs. surrounding 60 acre island of quality stores, $30,000,000, Austin Co., 16112 Euclid Ave., Cleveland, Zone 12, consult. engr.

▲ O., Independence and Seven Hills—HOMES—Mike Mural, 291 Cherry Lane, Independence, 122 homes. $3,000,000. Construction in the Spring.

▲ Okla., Tulsa—HOSPITAL—Wm. K. Warren Foundation, Warren Bldg., hospital. $4,000,000.

▲ Pa., Monroeville—CLINIC, etc.—Medical & Surgical Clinic of Pittsburgh, 2612 Mosside Blvd., plans by Pomerance & Breines, 33 W. 46 St., New York, N. Y., 8 story, steel medical and surgical clinic, nurses home, auditorium, $10,000,000.

▲ Tex., Dallas—SHOPPING CENTER—Cato Corp., c/o C. Grady Cates, Jr. & Louis J. Hexter, 1312 Main St., plans by Harwood K. Smith, Merc. Sec. Bldg., shopping center, Valwood Village, near here. $5,000,000.

▲ Tex., Houston—OFFICE—S. N. Adams, Adams Petroleum Center, c/o Highland Village Shipping Center, 4000 Westheimer St., 20 story tower and penthouse office bldg. $7,000,000. CD 10/21.

INDUSTRIAL BUILDINGS

▲ Calif., San Francisco—GENERATING PLANT—Pacific Gas & Electric Co., 245 Market St., constr. Hunters Point Steam Generating Plant addn., incl. 165,000 kw. generating unit. $21,000,000 Project to begin Summer 1956. CD 7/26/46.

▲ Colo., Denver — FACTORY — The Ramo-Wooldridge Corp., 8820 Bellanca St., Los Angeles, Calif. 160,000 sq. ft. factory, $5,000,000.

▲ Conn., Windsor—ENGINEERING and DEVELOPMENT CENTER—Combustion Eng. Co., Inc., 200 Madison Ave., New York, N. Y. nuclear engineering and development center to mfg. nuclear power equip. $5,000,000. Stone & Webster Eng. Corp., 90 Broad St., New York, N. Y., consult. engrs.

▲ Conn., Windsor Locks—PLANT—Hamilton Standard Div., United Aircraft Corp., Windsor Locks, plans by Olson, Miller & Cimino, 742 Asylum Ave., Hartford, 1 story, 21,000 sq. ft. plant addn., and 3rd floor present office bldg. addn. $3,000,000, Robert Loomis, 32 Maple Ave., Windsor, structural engr., Bids in January; plant expansion, $2,500,000.

▲ Ky., Burnside—PLANT—Cumberland Corp., Somerset, plant to produce charcoal briquets and chemical by-product called furfural on 38 acre tract main north-south route of Southern Ry. and on U. S. 27. $2,400,000.

▲ La., Baton Rouge—PLANT—Kaiser Aluminum & Chemical Corp., Kaiser Bldg., 1924 Broadway, Oakland, Calif., 500,000 ton alumina plant at Gramercy, near here, $60,000,000.

▲ Michigan—POWER PLANT—Detroit Edison Co., 2000 Second St., Detroit, St. Clair Power Plant, 300,000 kw. turbine-generator plant addn., St. Clair River, near St. Clair, $10,000,000, United Engineers & Constructors, Inc., 1401 Arch St., Phila., Pa., consult. engr.

▲ O., Newark—PLANTS—Kaiser Aluminum & Chemical Corp., Kaiser Bldg., 1924 Broadway, Oakland, Calif., 2 extrusion plants, rod, barv, wire and electric plant additions, $10,000,000.

▲ O., Sharonville — PLANT — Electric Auto-Lite Co., Kemper Rd., plant addn. for welding, assembly and shipping facilities. $4,000,000.

▲ Pa., Conshohocken—PLANT—Alan Wood Steel Co., Conshohocken, steel plant expansion, $14,000,000.

▲ W. Va., Ravenswood—PLANT—Kaiser Aluminum & Chemical Corp., Kaiser Bldg., 1924 Broadway, Oakland, Calif., 220,000 tons aluminum metal plant, $120,000,000. To go ahead April 1956.

▲ Wis., Milwaukee—PLANT—Evinrude Div., Marine & Outboard Mfg. Co., 4143 N. 27 St., mfg. plant. $2,000,000.

▲ Que., Baie Comeau—PLANT—Canadian British Aluminum Co. Ltd., subsidiary of British Aluminum Co., Norfolk House, St. James Square, London, England, aluminum plant, incl. smelter plant, new wharf power development and town site, $130,000,000. C. D. Howe Co., Ltd., 1421 Atwater Ave., Montreal, Que., consult. engrs. on smelter plant site and new wharf. H. G. Acres & Co. Ltd., 2135 Culp St., Niagara Falls, Ont., consult. engrs. on power development. Construction to proceed in four units with first unit probably starting next spring.

UNCLASSIFIED

▲† Arizona-Nevada—NATURAL GAS PIPE LINE—Nevada Natural Gas Pipe Line, Inc., 202 N. 2 St., Las Vegas, Nev. 130 mi. natural gas pipe line from Topock, Ariz. to Las Vegas, Nev. $4,103,188. To go ahead in 1956.

▲ N. J., Elizabeth—PORT ELIZABETH PROJECT—Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. Port Elizabeth project in 400-acre tract in Newark Bay to include mile long and 750 ft. wide channel to handle 25 vessels, $4,000,000.

▲ Texas—RURAL DISTRIBUTION LINES—Bowie-Cass Electric Co-operative, Douglasville, 200 mi. rural distr. lines, 24 mi. tie-lines sys. imprvs., Bowie and Cass Counties. $1,000,000. CD 10/23/53.

▲ Tex., Dallas—WIND TUNNEL—Chance Vought Aircraft, Inc., 9314 W. Jefferson St., wind tunnel (to generate 3,800 m.p.h. wind), $3,500,000. R. C. McWherter, J. M. Cooksey & W. E. Neuenschwander, c/o owner, consult. engrs.; wind tunnel data sys., $250,000. CD 8/20/52, under Industrial Buildings.

▲ Tex., San Antonio—PARKS, etc.—City, City Hall, defeated bonds Nov. 29, parks and recreation. $1,600,000. CD 11/10.

(Proposal Advertisements see p. 54 to 56)

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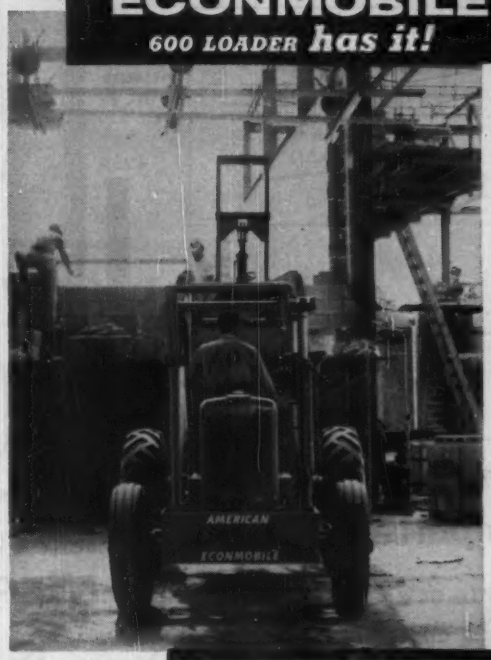

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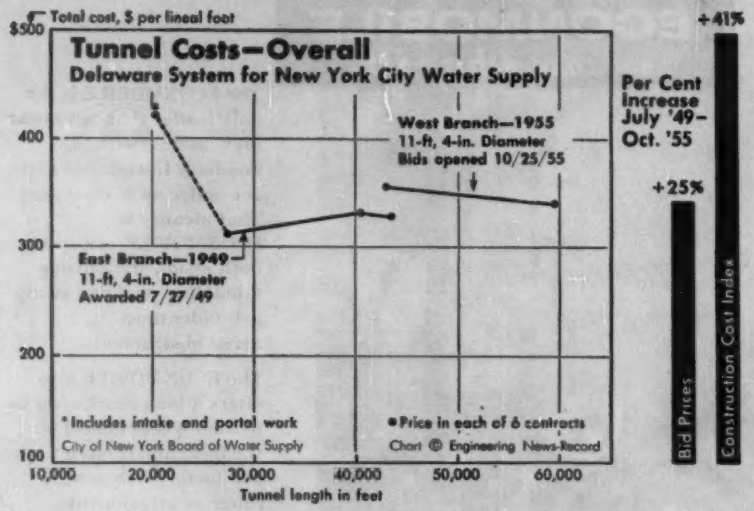

Tunnel Price Comparison Refined

Converting 1949 units to new contract settings places 1955 bid price rise at 25% though costs are up 41%

One of the two major difficulties is now resolved that prevented an accurate comparison of 1955 bids on the West Branch Delaware Tunnel for New York's Board of Water Supply with 1949 prices on the East Branch Tunnel, when the 1955 unit prices were reported, (ENR Nov. 3 p. 92). This was the completely different systems of pricing the two tunnels.

The Board of Water Supply has translated the 1949 unit quantities, cubic yards of excavation and concrete and linear feet of lining, into the 1955 system. This simplifies the pricing structure to linear feet of tunnel. These reworked 1949 figures put the East Branch 1949 contract price for tunnel excavation, lining with concrete, drainage channels, concrete forms and cement at $210 per linear foot compared with the 1955 contract price of $263 per linear foot on the West Branch tunnel. This is a rise of 25% in the bid price since 1949. It compares with a 41% rise in the Construction Cost Index which measures what the contractor has to pay for labor and materials. (49% is the cost index rise if New York City prices and wages are used rather than the 20 cities average). The price of portland cement went up 28.4% between the two bid dates.

The limiting of the rise in cost of tunnel work to 25% is due principally to use of roof bolt type of tunnel roof support in lieu of conventional rib type, a contract setup of items which this use conveniently permits and some advantages for the contractors in the 1955 contracts. These contractor advantages are more liberal time allowance in completing the job—five years—and opportunities for better progress, including shorter headings.

The 1955 pricing system, whereby the contractor is paid per linear foot of tunnel for excavating and lining, gives him a choice of drilling and blasting tight or loose. By blasting tight and trimming off the "tights," he can save on his excavation and concrete costs. In contrast, the 1949 contracts paid the contractors for excavation and concrete to a payment line called the "B" line. He was paid to this line regardless of how loose he drilled and blasted. However, experience showed that most contractors tended to blast loose to avoid tights along the tunnel bore. Sometimes, under the old contract system, the contractor was allowed excess concrete and cement to fill overbreakage which could have resulted from too loose drilling and blasting. The 1955 contracts give the contractor full self interest in economic drilling and blasting.

The 1955 contracts prescribe a new system of roof bolting for supported sections of the tunnel instead of rib support as used on the East Branch tunnel. The roof-bolt system means less excavation and less concrete per linear foot for the supported sections. Because roof bolts can be placed right up to the heading, the tunnel worker gets greater protection. Rib supports will be used in the West Branch tunnel where necessary but the contract only provides for a limited amount.

In addition to the benefits described above, the switch from cubic yard to linear foot quantities for bidding will reduce engineering costs on the job and will simplify progress estimates by the engineers for progress payment to the contractor, joint venture Johnson Drake & Piper, Inc., New York; Grafe-Callahan Construction Co., Los Angeles; Tecon Corp., Dallas; Winston Bros. Co., Minneapolis; and Conduit & Foundation Corp., Philadelphia.

Irrigation Laterals, Wyo.

About 23.4 miles of laterals, sublaterals and 11.2 miles of drains and wasteways on the Eden Project, Wyoming, are constructed by Sharrock and Pursel, Casper, Wyo., whose low bid of $845,454 was 22% above the engineer's estimate of $692,775.

Work is for the Bureau of Reclamation, Rock Springs, Wyo., to supply water to some 20,000 acres.

1C Sharrock & Prusel, P.O. Box 316, Casper, Wyoming	$845,454
2 LeGrande Johnson Construction Co., Inc., 639 E 1st South Logan, Utah	867,724
3 Platte Valley Construction Co., Box 598, Grand Island, Nebraska	1,067,985

Bids: 11-1-55 * Items:	Unit	Quantity	Unit Prices 1C	2
Excav for lateral	cy	513,000	$0.38	$0.46
for structures	cy	16,300	1.00	2.25
Remove exist struct	ls	lsb	10,000	8,050
Fill Eden Canal	cy	94,000	0.25	0.20
Earth lining, p & c	cy	123,000	0.50	0.46
matls, blend	cy	60,000	0.15	0.25
Embankments, compact	cy	142,000	0.20	0.21
Exc stockpiles for embkmt	cy	78,000	0.20	0.17
Bkfl about struct	cy	12,400	0.50	0.65
compact	cy	6,830	4.00	2.50
Overhaul	cy/m	2,500	0.20	0.20
Sand & grav bed for riprap	cy	710	11.50	12.00
Riprap	cy	2,200	11.50	12.00
Concrete in structures	cy	1,290	125.00	90.00
Cmt, furn & handle	bbl	1,910	8.00	7.75
Reinf bars, f & p	lb	122,800	0.18	0.16
½" elast fill matl i j, f & p	sf	53	2.00	3.00
6" rubber water stops i j, f & p	lf	72	3.00	3.00
CMP, 36", f & i	lf	40	12.00	11.21
Culv pipes, conc, std str, type B jnts, 18", f & i	lf	2,620	6.00	5.35
24"	lf	1,420	8.00	7.95
30"	lf	520	11.00	10.85
36"	lf	55	15.00	14.00
HC50 conc pre pipe, type R jnts, 36", f & i	lf	440	30.00	24.37
42"	lf	230	38.00	31.48
54"	lf	220	55.00	44.31
66"	lf	190	70.00	60.65
Pipe transitions, prec conc, 18", f & i	ea	32	100.00	49.37
24"	ea	5	150.00	79.77
Fabr bends in prec conc pipe, 18"	ea	32	50.00	40.00
24"	ea	29	60.00	50.00
30"	ea	10	75.00	65.00
36"	ea	11	220.00	223.00
42"	ea	5	230.00	259.00
54"	ea	2	330.00	440.00
66"	ea	3	600.00	622.00
Timber in struct, furn & erect	mbf	35	300.00	354.00
Pipe rails for cattle guards on bridge, f & i	lf	200	2.00	3.00
Cattle guards, furn & constr	ea	22	500.00	1,300
Barbed wire fences, ROW, furn & erect	mi	29	1,200	1,828
Protective fences, f & e	lf	370	3.00	1.50
Slide gates, CI, 18", f & i	ea	75	100.00	102.00
24"	ea	13	150.00	134.20
30"	ea	3	175.00	204.00
36"	ea	3	300.00	340.00
Misc metalwork, f & i	lb	8,790	0.75	0.60

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Capital Spending to Set New First-Quarter Record

American businessmen are planning to spend more money for new plant and equipment in the first quarter of 1956 than in any previous first quarter on record.

That's the cheerful story told by the joint estimate just released by the Department of Commerce and the Securities & Exchange Commission. The total will be about $7.3 billion. This is 15% more than the record first-quarter investment in 1953. It is about 25% more than the first quarter of 1954, which was the low point for the recent period.

• **Confirmation**—The Commerce-SEC forecast helps to confirm the McGraw-Hill Economics Department's finding that businessmen plan to spend about 13% more for new plants and equipment in 1956 than in 1955 (ENR Nov. 17, p. 97). The seasonally adjusted annual rate would be $31½ billion, a little less than 2% above the annual rate for the quarter just ending, and 12% above the average for the full year of 1955.

Recovery in capital spending was rapid this year, after a slow first quarter. By the third quarter, capital spending had passed its previous peak. If fourth-quarter programs are realized, the 1955 total will be $28.3 billion. That would be a gain of $1.5 billion over 1954, and as much as was spent in the previous record year of 1953.

The largest relative increases planned for the first quarter of 1956 as compared with the 1955 average are by the railroads (55%) and by manufacturers (18%), particularly durable-goods manufacturers (25%). However, every major industrial classification plans to spend more in the first quarter of next year. Makers of non-durable goods expect spending to be up 12%. Moderate increases are shown in the scheduled projects of commercial firms (up 5%), public utilities (up 5%), mining (3%), and other transportation companies (up 3%).

• **Manufacturers**—The big push comes from manufacturers. All the major durable-goods industries have shown a strong upward trend in investment during 1955, and this is carrying into the next quarter. Except for primary metals, spending by all major durable-goods groups in the next quarter is expected to top outlays in any previous first quarter. Spending will hold up even in several industries where there is usually a sharp reduction in spending during the winter. This is true of makers of transportation equipment, primary metals, and stone, clay and glass, where spending will be close to or greater than fourth-quarter programs.

Capital spending by makers of non-durable goods has also moved up this year, but at a slower rate. The scheduled rate of outlays in the first quarter of 1956 is substantially above the first-quarter 1955 rate in the paper, chemicals, petroleum, and rubber industries. And it is a little higher for textiles and for the food and beverages group.

• **Other industries**—In industries outside the manufacturing field, only the railroads appear to be extending their 1955 increases into the next quarter. The other industries, while scheduling first-quarter 1956 spending above the 1955 average, are tending to level off.

The railroads plan spending during the first quarter of 1956 at an annual rate of $1.4 billion, almost double the annual rate in the first quarter of this year, and close to the peak rates of 1951 and early 1952.

The Money Pinch

It's hard to borrow now, but situation may change

In spite of the current money pinch, it's still possible for a toll bridge to get financing in Wall Street. A group of underwriters bought $46 million of 40-year revenue bonds from the California Toll Bridge Authority last week which will finance a new four-lane bridge across Carquinez Straits, an arm of San Francisco Bay. But net interest cost to the borrower was a stiff 3.71%.

Other public agencies have been paying handsome rates to borrow right now. The Long Beach (Calif.) Unified School District had to pay 3% last week on a $10-million issue of general-obligations maturing from 1957 through 1976. This issue had been rated as sound, though not top-grade.

However, there is plenty of work coming up for financing next year—and rates may well be a bit easier then. Last week brought plenty of news along this line:

• The Michigan Turnpike Authority has decided to ask for legislative permission to build its toll road all the way from the Straits of Mackinac 330 mi down to the Ohio line, instead of starting a 113-mi pike at Saginaw. It believes a longer route would make the bond more saleable.

• The California Toll Bridge Authority has received a favorable engineering report for another San Francisco-Oakland bridge, to cost about $249 million. The state legislature isn't expected to take action till spring.

• Gov. George M. Leader of Pennsylvania has OK'd a bill giving the Delaware River Port Authority the power to build a toll bridge across the Delaware between Philadelphia and Camden. This will cost between $45 million and $54 million. New Jersey's legislature must OK the project, and this is not expected till early next year.

• **The New Jersey Highway Authority** will build an $18-million connecting road between its Garden State Parkway and the New York Thruway.

Private Home Starts Declined More Than Seasonally in Nov.

Private home starts in November were at the lowest rate this year, according to last week's report by the Labor Department. At the seasonally adjusted annual rate, about 1,200,000 units were started, about 3% below the previous two months. Actual private starts were 89,200, about 12% below the same month last year.

• **Ammunition**—This means November starts were down slightly more than the usual seasonal factors would explain. It gives more ammunition to homebuilders and Washington housing officials who believe terms on government-insured mortgages should be eased. For instance, Housing & Home Finance Administrator Albert Cole believes that starts next year will have to run between 1,200,000 and 1,300,000 to meet demand. If necessary, Cole would like credit curbs eased so that this total could be reached.

For 1955, the outlook is that a little more than about 1,300,000 private homes will be started—which would make 1955 the second biggest home-building year in history, next to 1950. About 1,237,000 units were started during the first 11 months.

(*B&F continued on page 53*)

Maybe LEVINSON has the steel you are looking for!

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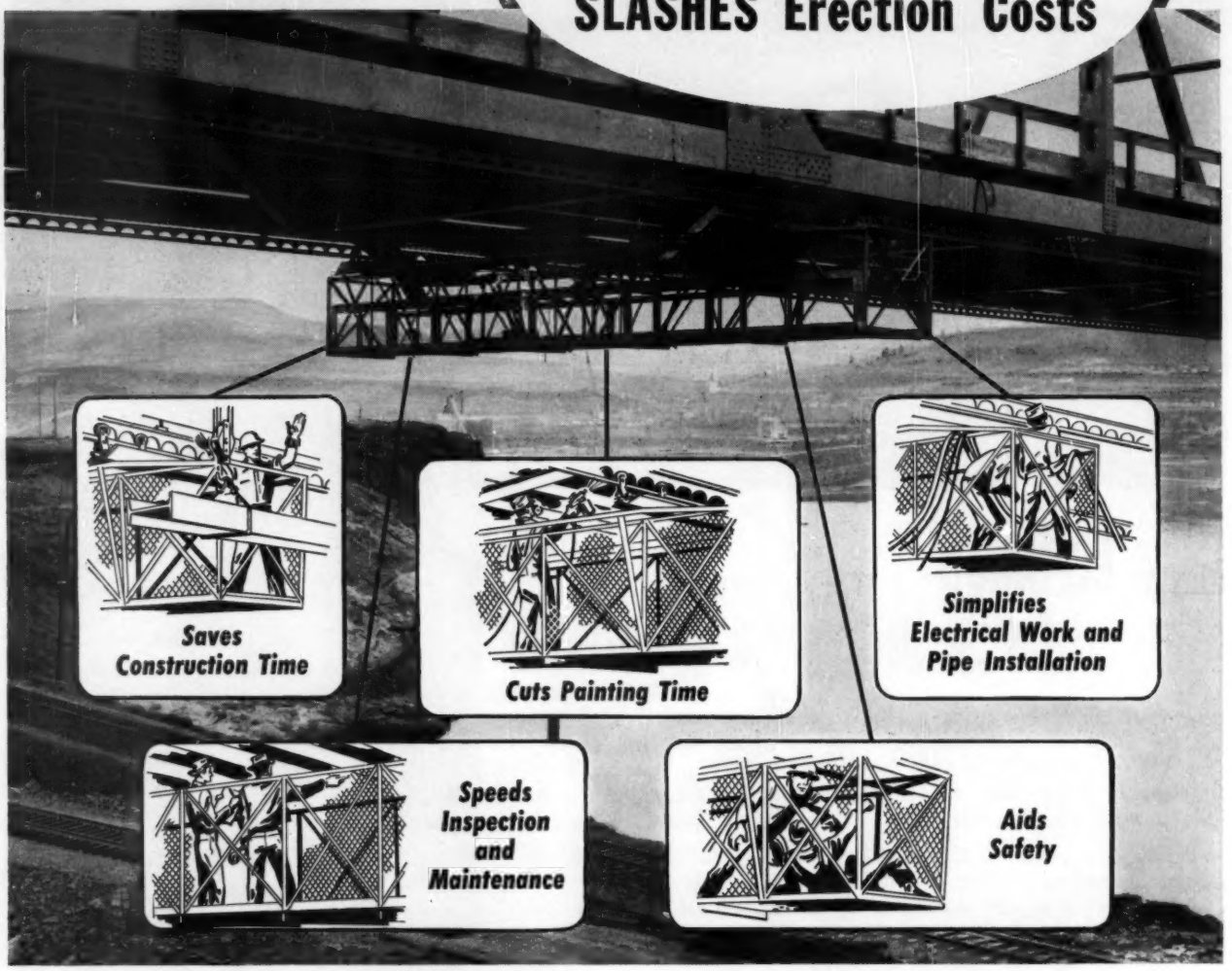
Illustrated is one of six Cleveland Tramrail Travelers on the Dalles Bridge over the Columbia River. Traveler length is 37'-6". Operation is by handwheel drive. Complete fence enclosure assures maximum safety.

TRAMRAIL Bridge Traveler SLASHES Erection Costs



BIG savings in time and money can be made with a Cleveland Tramrail bridge system both during erection and later for inspection and servicing.

Advantages that the equipment provides for erection work alone usually justify its installation by a bridge contractor — even if not called for in the specifications. Time saved in many phases of bridge construction makes the equipment profitable. The savings do not stop with the completion of a bridge. They continue year after year by reducing man-hours required for inspection, painting and miscellaneous servicing work.

It will pay you to look into the possibilities that a Cleveland Tramrail Bridge System offers for new bridges to be built, as well as for existing ones.

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CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
3188 East 284 St. Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Apartment Construction Does Turnaround in 1955

The market for new apartment buildings has staged a turnaround during 1955. After a fast gain in contract awards reported to ENR in the first half, which amounted to a 29% increase over 1954, the margin has since been shrinking.

So far in the second half, October has been the only month to top a year ago, and that was by a narrow margin. The total volume of awards for July through November is 31% below the same months of last year. However, total volume for the 11 months is up 4% over 1954 to $349 million, the best figure since 1950's record.

Hotel construction awards are lagging 18% behind last year, with a total of $37 million. It looks as if 1955 will be the second consecutive year of declining hotel awards.

M&M Takes Lead in Hiking Prices on Plywood Panels

M&M Woodworking Co. has boosted prices on plywood panels.

There's a $3 increase per thousand sq ft on the ¼-in. thickness. The key A-D grade has been selling at $85 and thus is now $88. And there is a $10 increase on ¾-in. panels, raising the price per thousand sq ft from $185 to $195. The increases cover all interior and exterior sanded panels, which account for about 75% of plywood production.

Indications are that U. S. Plywood Corp. will follow suit, effective Jan. 1, and other companies are expected to fall in line.

These increases do not affect the recent cut in sheathing grade plywood (ENR Dec. 15, p. 103), which most firms carry on a separate price list.

Business Briefs . . .

Industrial construction in 1956 may be 15% to 20% above the boom level of 1955, according to an estimate by Walter Kidde Constructors, Inc. The firm bases its estimate on industry's drive to modernize and expand capacity, broaden product lines, and keep up with technological change. However, Kidde believes that more emphasis will be placed on equipment, less on the building shell.

Cement mill—Lehigh Portland Cement Co. plans to increase annual capacity of its Mason City (Iowa) plant by 1,000,000 bbl. The new capacity will be available in 1957. This is in addition to previously announced plans (ENR Dec. 15, p. 21).

Activity This Week

As reported to ENR
(In millions of dollars)

Amount of contracts let

(millions of dollars)	This Week	Cumulative 51 wks 1955	1954	% chge
By Ownership				
Federal	$35.1	$1,629.6	$1,266.1	+29
State and municipal	162.5	5,316.4	4,872.9	+9
Total public	197.6	6,946.0	6,139.0	+13
Total private	260.8	11,499.1	8,056.9	+43
U. S. Total	$458.4	$18,445.1	$14,195.9	+30
By type of work				
Waterworks	$5.1	$304.5	$240.0	+27
Sewerage	19.6	397.9	382.2	+4
Bridges	18.3	529.6	494.9	+7
Highways	44.2	2,095.4	1,851.8	+13
Earthwork, waterways	20.6	545.7	324.0	+68
Buildings:				
Public, excl. housing	38.7	1,711.3	1,728.8	−1
Public housg.	2.2	264.4	255.1	−3
Private housg.	107.6	6,082.2	4,206.3	+45
Commercial	32.0	1,630.5	1,404.0	+16
Industrial	112.0	2,887.5	1,853.8	+56
Unclassified	58.1	2,014.1	1,455.0	+38
U. S. Total	$458.4	$18,445.1	$14,195.9	+30

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

New capital for construction

(millions of dollars)	Week of Dec. 15	Cumulative 50 Wks 1955	% Chge '54-'55
Corporate securities	$70.6	$3,578.4	+39
State and municipal:			
All except housing	165.3	4,724.4	−11
Housing	4.0	97.1	+7
Federal loans	0.8	124.5	+10
Federal aid	...	853.5	+27
Total nonfederal	$240.8	$9,377.8	+7
Federal appropriations:			
In U. S.	...	$3,379.7	+63
Outside U. S.	...	84.6	+155
Total new capital	$240.8	$12,842.1	+18

ENR cost and volume indexes, 1955

		Base years = 100 1913	1926	1949
Construction cost	12/15	673.18	323.60	141.12
	12/1†	673.13	323.57	141.11
Building cost	12/15	478.75	258.80	136.09
	12/1†	478.70	258.77	136.08
Volume	Nov.	561	228	162
	Oct.	628	255	182

† Official ENR Indexes for December

IF IT'S A
WET JOB
PLAY SAFE! ASK FOR A DEWATERING ANALYSIS BY
GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

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SPRAGUE & HENWOOD, Inc.
Dept. E, Scranton 2, Penna.

Prevailing Wages on Highway Projects

AGC spearheads efforts to steer Congress clear of wage-fixing provisions in federal highway legislation proposals

Application of prevailing wage requirements to federal highway legislation has again become a controversial issue as the opening of the 84th Congress approaches.

The first salvos were fired by various chapters of Associated General Contractors of America and by the National Council of Construction Associations, holding its organizational meeting in Charlotte, N. C., just as the AFL and CIO were merging into their new 15,000,000-member federation in New York.

Contractor criticism of the Davis-Bacon Act followed close on the heels of the annual convention of the AFL-CIO Building and Construction Trades Department, which again stressed the necessity of continuing its efforts to achieve significant changes in the federal law and its extension to a federal highway program.

Although the 83rd Congress failed to act on President Eisenhower's big highway plan, now slated for another whirl, the building trades were encouraged by the progress they made last session. Both the Senate and House Public Works Committees favored inclusion of prevailing wage provisions and these were eventually inserted in the three highway bills debated in the House. They were later knocked out by the Senate. Now some congressmen say they'll be included in next year's legislation "as sure as sun-up."

• **Contractor views**—The AGC attack, launched at a special North Carolina meeting attended by contractors and highway authorities from 30 AGC chapters in 12 states (mostly southern) embraced these views:

• The Davis-Bacon Act is itself an "unwholesome" piece of legislation. Wages should "be predetermined at home," instead of on the federal level. The act has demonstrated the dangers of "maladministration," seriously abridges the right of collective bargaining, has resulted in "unrealistically high wages," and affords contractors no right to judicial review of wage determinations made by the Secretary of Labor.

• If extended to a public highway program, prevailing wage requirements would increase construction costs by more than 25%.

• **Labor's position**—Basic to the building trades' position is a two-fold premise: Labor standards won by the building trades and now prevailing, must be protected. Prevailing wage requirements protect union contractors in their competitive battle with open-shop contractors.

What the building trades hope to see is a "modernization" of the Davis-Bacon Act. They claim emergence of indirect forms of pay (fringe benefits) and the trend away from direct federal spending to indirect guarantees have made the law obsolete. Their recommendations include:

• Extension of prevailing wage requirements to all construction directly or indirectly done by the federal government or with its financial assistance. This would make the present multiplicity of prevailing wage legislation (ENR April 7, p. 118) uniform in its application and would catch such things as FHA-insured and VA-guaranteed home construction, as well as federally-assisted road building.

• Inclusion of prevailing cash remunerations (travel, subsistence, vacation) and other forms of compensation (health, welfare, pension) along with basic rates in wage determinations.

• Complete investigative and enforcement powers in the Secretary of Labor. (Present responsibility is divided between the Secretary and the agency sponsoring the construction.)

Such a major overhaul of the Davis-Bacon Act is not likely to be easily achieved and piece-meal legislation is the more promising prospect. At their recently concluded convention, the building trades agreed to continue their campaign on that basis.

Meanwhile the AGC early this month spearheaded formation of the National Council of Construction Associations, representing state highway departments, AGC chapters, ARBA chapters, highway contractors and other construction industry groups.

The new organization has unanimously adopted a resolution questioning the constitutionality and equity of the Davis-Bacon Act and opposing enactment of federal highway legislation containing wage-fixing provisions. It has also appointed a five-man committee to direct its activities in blocking such proposals.

OFFICIAL PROPOSALS

Bids: January 11, 1956

Delaware Interstate Highway Division

NOTICE TO BIDDERS
CONTRACT NO. 33
MEMORIAL PLAZA

Sealed proposals for the construction of Memorial Plaza adjacent to Toll Plaza, along the South side of the approach to "The Delaware Memorial Bridge" over the Delaware River near Wilmington, Delaware, will be received by the Delaware Interstate Highway Division at the Administration Building, Delaware Memorial Bridge near Wilmington, Delaware, until 12 o'clock noon Eastern Standard Time, January 11, 1956, at which time and place said proposals will be opened and read.

The work consists generally of the construction of war memorial, inclusive of all grading, filling, landscaping, concrete work, paving, stonework and miscellaneous work for a complete memorial plaza.

Work on Contract No. 33 shall begin promptly after the execution of the Contract and shall be completed on or before May 10, 1956.

Monthly payment will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms provided by the Division.

Each proposal must be accompanied by an acceptable surety bond or certified check to the amount of at least ten (10) per cent of the total amount of the proposal.

The Contract will be awarded or proposals rejected within twenty (20) days from the date of opening proposals. The right is reserved to reject any or all bids.

One set of the contract documents may be obtained from the Delaware Interstate Highway Division, at the Administration Building, Delaware Memorial Bridge, near Wilmington, Delaware and from the Consulting Architect, A. Gordon Lorimer, 254 West 54th Street, New York 19, N. Y., after December 21, 1955, upon payment of $15.00. Contract documents need not be returned and the above payment will not be refunded. Checks shall be made payable to A. Gordon Lorimer.

The Plans and Specifications and other contract documents may be examined at the office of the Delaware Interstate Highway Division, at the Administration Building of the State Highway Department, Dover, Delaware, and at the office of the Consulting Architect, A. Gordon Lorimer, 254 West 54th Street, New York 19, New York.

Delaware Interstate Highway Division
By: Garret E. Lyons, Director
W. B. McKendrick, Jr., Chief Engineer
Delaware Interstate Highway Division
December 14, 1955.

Bids: January 16, 1956

Fairfax County, Virginia Integrated Sewerage System

Sealed bids will be received at the Office of the Sanitary Engineer, County of Fairfax, Fairfax, Virginia, until Monday, January 16, 1956 at 2:00 P.M. EST for the construction of Contract No. 59: Approximately 50,000 lin. ft. of 8 to 27-inch sanitary sewers and appurtenances. Plans and contract documents may be examined and copies thereof obtained at the Office of the Sanitary Engineer, upon payment of $10.00 per set, which shall not be returnable. Checks should be made payable to DIRECTOR OF FINANCE. Contractors, whether resident or non-resident in Virginia, will be required to show evidence of a Certificate of Registration as required by Chapter 7 of Title 54 of the Code of Virginia before their bids will be considered. Each bid must be accompanied by cash, certified check, or by an acceptable bidder's bond in an amount not less than 5% of the amount of the total bid. The successful bidder will be required to furnish a performance and maintenance bond in a penal sum equal to the full contract price. No bid may be withdrawn for a period of 30 days after the opening thereof and the right is reserved to waive any informality therein and to reject any or all bids.

Harry L. Hale
Sanitary Engineer
Dated: December 14, 1955

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $1.80 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch. (Effective Jan. 1956 the rate will be $2.10 per line)

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

Bids: January 17, 1956

Power Authority of The State of New York

ST. LAWRENCE POWER PROJECT
ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY OF FIXED HOISTS FOR MASSENA INTAKE
SPECIFICATIONS NO. PA-5-15053
ST. LAWRENCE CONTRACT NO. P-31

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the manufacture and furnishing of eight (8) Fixed Hoists for Massena Intake and delivery thereof f. o. b. destination in the following ways:

(1) If brought in person, on the day of receiving bids until 10:30 A. M. Eastern Standard Time on the 17th day of January, 1956, 270 Broadway, Hearing Room C on the sixth floor, New York 7, New York.

(2) If mailed in, until 10:15 A. M. Eastern Standard Time, on the 17th day of January, 1956, at the Authority's office, 270 Broadway, Room 1300, New York 7, New York.

The proposal will be publicly opened and read aloud at the time and at the address given in (1) above.

Bids will be entertained for eight (8) fixed hoists and accessories.

Bids will not be restricted to American manufacturers.

Plans, specifications and proposal forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall and Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours, and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Twenty ($20.00) Dollars per initial set of contract documents and Ten ($10.00) Dollars per set for additional sets, no part of which will be refunded. Two sets must be returned with each bid.

Bids must be made in duplicate upon the proposal forms included in and bound with the Contract Documents. A bid deposit will be required with each bid in an amount not less than 10 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
PA-5-15053 GENERAL MANAGER

Bids: January 10, 1956

Contracts 420, 421 and 438

CONTRACT 420—ELECTRIC LIGHTING EQUIPMENT
CONTRACT 421—PLUMBING EQUIPMENT
CONTRACT 438—GASOLINE-ENGINE GENERATOR SETS

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Standard Time, on Tuesday, January 10, 1956, for each of Contracts 420, 421 and 438, as follows:

CONTRACT 420, for furnishing, delivering, installing and testing electric lighting equipment, complete in every respect, for the Neversink intake chamber, the Downsville release water chamber, and the East Delaware intake and outlet chambers of the Delaware system, located in the Town of Neversink, Sullivan County, and Town of Colchester, Delaware County, New York.

CONTRACT 421, for furnishing, delivering, installing and testing plumbing equipment and appurtenances for the Neversink intake chamber, located in the Town of Neversink, Sullivan County, New York, and the East Delaware intake and Downsville release water chambers, located in the Town of Colchester, Delaware County, New York.

CONTRACT 438, for installing gasoline-engine generator sets and appurtenances and performing miscellaneous work at the West Branch effluent chamber, located in the Town of Carmel, Putnam County, and at the Kensico South effluent chamber, located near Valhalla, Westchester County, New York.

Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., of each of the three contracts can be obtained in the Chief Clerk's office, Room 1317, at the above address, upon application in person or by mail, by depositing the sum of $5.00 for each pamphlet. Within 30 days following the award of contract or rejection of bids the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of $4.00 will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners, Board of Water Supply; BETTY COHEN, Acting Secretary.

Bids: January 1, 1956

Dunlap, Sequatchie County, Tennessee

NOTICE TO CONTRACTORS
HIGHWAY BRIDGE,
SEQUATCHIE RIVER,

Sealed bids for the removal of the remaining portion of the old bridge structure across the Sequatchie River southeast of Dunlap, Sequatchie County, Tennessee, and for the construction of a new highway bridge at the same site, will be received until 2:00 P.M. January 7, 1956, in the office of the County Judge, Court House in Dunlap, Tennessee, and then and there publicly opened and read aloud.

The work shall include:

1. The dismantling of the remaining portion of the old bridge.
2. The disposal and the removal of the material in this structure in a manner satisfactory to or as directed by the Engineer.
3. The construction of a new bridge.

The principal items of the new work to be done and materials to be furnished and placed are approximately:

Substructures
310 cu. yds. of Earth Fill
190 cu. yds. of Concrete, Class "A"
17,500 lbs. of Reinforcing Steel
1,260 lin. ft. of Untreated Timber piling
420 lin. ft. of Treated Timber piling
New Superstructure
100 cu. yds. of Concrete, Class "A"
16,600 lbs. of Reinforcing Steel
28,200 lbs. of Structural Steel—Rolled Beams
84,000 lbs. of Structural Steel—Welded Plate Girders
21,000 lbs. of Structural Steel—Miscellaneous (Including Handrail Post)
3,000 lbs. of Metal Handrail

Copies of Specifications and Drawings may be obtained at the Office of the County Judge, Sequatchie County, Dunlap, Tennessee, upon payment of twenty-five ($25.00) dollars per copy which will be refunded when the copy is returned in good condition.

Each proposal or bid must be accompanied by a cashier's or certified check on a duly organized Bank made payable to Sequatchie County, Tennessee, or a bid bond executed by the bidder and a Surety Company authorized to transact business in the State of Tennessee, in the sum of not less than five percent (5%) of the total amount of the bid. Said check or bond will be returned to the unsuccessful bidder as soon as the contract has been awarded, or all bids rejected, and to the sucessful bidder as soon as he has executed the contract and furnished a liability and performance bond in the amount of fifty percent (50%) of the contract price, same having been approved by the County Attorney, and after the contract has been executed by the County.

All bidders must be licensed contractors as required by Chapter 135 of the Public Acts of 1945 of the General Assembly of the State of Tennessee. Bidder's name and license number must be placed on the sealed envelopes containing the bid.

All bids must be made out on the proposal form found in the documents. No interlineations, additions, or deletions shall be made in the proposal form by the bidder.

Time of the competition of the work is the essence of this contract and the number of working days required by the bidder to do and complete the project shall be stated on the proposal form where so called for. The successful bidder shall be required to complete the work within the time stipulated by him. Liquidated damages for delays shall be thirty ($30.00) dollars per day.

The Sequatchie County Highway Commission reserves the right to waive any informalities in or to reject any or all bids or to accept any bid which they deem to be the most favorable to the interest of the County.

T. A. GREER, JR., COUNTY JUDGE,
SEQUATCHIE COUNTY, TENNESSEE

Bids: January 5, 1956

New Jersey Turnpike Authority

ADVERTISEMENT FOR PROPOSALS
CONTRACT NO. N-61F

Sealed proposals are invited for Contract No. N-61F for the furnishing and installation of the Food Service Equipment for the Service Building at Service Area 8S on the Newark Bay-Hudson County Extension of the New Jersey Turnpike, in Jersey City, New Jersey.

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11:00 O'Clock, Eastern Standard Time, on the morning of January 5, 1956, at which time and place said proposals will be publicly opened and read.

Bidders must submit with their proposal a Contractor's Financial and Equipment Statement.

Contract Documents may be examined during office hours after December 15, 1955, at the office of the Authority, and at the office of the Consulting Architects, Lorimer & Rose, 254 West 54th Street, New York 19, New York. Contract Documents will be furnished upon payment of Ten Dollars ($10.00) for each set, upon application to the Authority. Contract Documents are not required to be returned and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast, Chairman
December 12, 1955

OFFICIAL PROPOSALS

Bids: December 29, 1955

Power Authority of the State of New York

ST. LAWRENCE POWER PROJECT
ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY
OF INSULATED
WIRE AND CABLE
SPECIFICATIONS NO. PA-5-14012
ST. LAWRENCE CONTRACT NO. P32

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the design, manufacture and furnishing of insulated wire and cable and delivery thereof, f. o. b. cars at destinations, in the following ways:

(1) If brought in person on the day of receiving bids until 10:30 A. M. Eastern Standard Time on the 29th day of December, 1955, Hearing Room C on the 6th Floor, 270 Broadway, New York, New York.

(2) If mailed in until 10:15 A. M. Eastern Standard Time on the 29th day of December, 1955, at the Authority's office, 270 Broadway, Room 1800, New York 7, New York.

The proposals will be publicly opened and read aloud at the time and at the address given in (1) above. Bids will be entertained for the insulated wire and cable in accordance with the bidding schedules. Installation of the wire and cable will be done by Others. Delivery of the insulated wire and cable will be required starting April 1, 1956.

Specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall and Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, may be inspected by prospective bidders during office hours, and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1800, New York 7, New York, upon application and prepayment of a fee of Ten ($10.00) Dollars for initial set of contract documents and Five ($5.00) Dollars per set for additional sets, no part of which will be refunded. Two sets must be returned with each bid.

Bids will not be restricted to American manufacturers.

Bids must be made in duplicate upon the proposal forms included in and bound with the Contract Documents. A bid deposit will be required with each bid in an amount not less than 10 per cent of the maximum price bid for any schedule.

The right is reserved to reject any or all bids.

W. S. Chapin
PA-5-14012 GENERAL MANAGER

Bids: January 12, 1956

Delaware River Port Authority Administration Building Camden, New Jersey

BRIDGE ROADWAY
TRAFFIC LANE MARKER STRUCTURES
CONTRACT NO. 8

Sealed bids will be received for TRAFFIC LANE MARKER STRUCTURES OVER THE WALT WHITMAN BRIDGE ROADWAY between Front Street, Philadelphia and Newton Creek in Gloucester, New Jersey, known as Contract No. 8, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 2:30 P.M., (Eastern Standard Time), January 12, 1956, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon a deposit of $10.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $10,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 per cent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO,
Executive Director

Bids: January 12, 1956

Delaware River Port Authority Administration Building Camden, New Jersey

LIGHTING AND ELECTRICAL WORK
CONTRACT NO. 7

Sealed bids will be received for LIGHTING AND ELECTRICAL WORK FOR THE WALT WHITMAN BRIDGE STRUCTURE AND TOLL PLAZA, PHILADELPHIA, PENNSYLVANIA, for the new bridge between Packer Avenue, Philadelphia and Gloucester, New Jersey, known as Contract No. 7, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 2:30 P.M., (Eastern Standard Time), January 12, 1956, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon a deposit of $10.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $100,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 per cent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO,
Executive Director

Bids: January 12, 1956

Fairfax County, Virginia Integrated Sewerage System

Sealed bids will be received at the Office of the Sanitary Engineer, County of Fairfax, Virginia, until Thursday, January 12, 1956 at 2:00 P.M., EST for the construction of Contract No. 51: Approximately 3600 lin. ft. of 24 and 30-inch Sanitary sewer effluent and appurtenances, including 1000 lin. ft. of submerged steel pipe on wood piles. Plans and contract documents may be examined and copies thereof obtained at the Office of the Sanitary Engineer, upon payment of $10.00 per set, which shall not be returnable. Checks should be made payable to DIRECTOR OF FINANCE. Contractors, whether resident or non-resident in Virginia, will be required to show evidence of a Certificate of Registration as required by Chapter 7 of Title 54 of the Code of Virginia before their bids will be considered. Each bid must be accompanied by cash, certified check, or by an acceptable bidder's bond in an amount not less than 5% of the amount of the total bid. The successful bidder will be required to furnish a performance and maintenance bond in a penal sum equal to the full contract price. No bid may be withdrawn for a period of 30 days after the opening thereof and the right is reserved to waive any informality therein and to reject any or all bids.

Harry L. Hale
Sanitary Engineer

Dated: December 13, 1955

Bids: Early 1956

Road Construction in Ecuador

Bids will be requested early 1956 for construction of Nobol-Portoviejo Road in west part (lowlands) of Ecuador. Contract includes grading, structures, flexible base and asphalt surface on about 150 kilometers of road. Terrain is about ⅓ flat, ⅓ rolling and ⅓ hilly. Estimated cost about 4 million dollars, partially financed by International Bank Loan. Due to rainy season usually December 20th to May 1st, interested contractors should inspect terrain immediately. For further information write to:

César Durán Ballén
General Superintendent, Comitè de Vialidad
P. O. Box 4182
Guayaquil, Ecuador

U. S. Government

United States Department of Commerce, Bureau of Public Roads, December 15, 1955. SEALED BIDS will be received at the office of the Inter-American Highway Office, Bureau of Public Roads, Room 4009, General Services Building, Washington 25, D. C., until 2:00 p.m., e.s.t., January 19, 1956, for construction of Rama Road Project R-3A in the Republic of Nicaragua. The project begins at Muhan about 23 miles east of Santo Tomas and extends easterly toward Rama for approximately 15 miles. Bidders will be limited to United States or Nicaragua firms with a satisfactory record of performance on highway construction in the United States of America or in the Republic of Nicaragua. The approximate quantities of the major items of work are: 57 Hectares Clearing and Grubbing 707,000 cubic meters Unclassified Excavation, 50,000 cubic meters Selected Borrow Base, 2,400 cubic yards Class "A" Concrete, 322,000 lbs. Reinforcing Steel, 480,000 lbs. Structural Steel and 8,000 linear feet Nestable Bituminous Coated Corrugated Metal Culvert Pipe (from 24" to 72"). Special conditions of work performed by U. S. Government in foreign areas apply as well as local laws. Plans, Specifications and Proposal Forms are available upon request at the address given above, or at the Inter-American Highway District Office, Bureau of Public Roads, 516 Avenida Roosevelt, Managua, Nicaragua. C. D. Curtis, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4590) will be received at Ephrata, Washington, until February 2, 1956, for furnishing labor and materials for Earthwork, Concrete and Soil-Cement Lateral Lining, and Structures, West Central Part of Block 89 Laterals and Wasteways, West Canal Laterals, Columbia Basin Project, Washington. Location south of Ephrata, Washington. Principal items are 378,000 cu. yds. excavation; 6,570 cu. yds. concrete in structures and lining; 2,000 cu. yds. soil-cement lining; furnishing and installing 9 outdoor-type pumping units; and other work. Completion time 310 days. For particulars, address Bureau of Reclamation, P. O. Box 368, Ephrata, Washington; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

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Electrical engineer, construction, foreign air base project—lines, buildings and utilities. P-8347, Engineering News-Record.

Engineer-Estimator for building construction work in Utah. An engineer for building construction work qualified to estimate and layout all phases of building construction. Please give training, experience and references. P-8465, Engineering News-Record.

Wanted: Bridge & Highway designers with office and field experience by consulting engineering firm in Pennsylvania. Give complete details and salary desired. P-8381, Engineering News-Record.

Bridge Designers — Civil Engineering graduates of accredited U. S. Schools; at least 4 years experience required on design structural steel and reinforced concrete railroad and highway bridges. Send complete details, education, experience, salary requirements first letter. All applications acknowledged; qualified men will be interviewed. P-8501, Engineering News-Record.

Wanted Earth and Rock Foreman; must be thoroughly experienced in drilling and blasting, and must have not less than five to ten years experience in open cut rock excavation with heavy construction contractors. Permanent position and highest salary for suitable man. Location Pennsylvania or Maryland. State age, experience, recent employers, salary and when available. P-8622, Engineering News-Record.

Industrial Builders (N. J.) require executive general superintendent, experienced job superintendents. Send resume and references. P-8649, Engineering News-Record.

Wanted Superintendent-Engineer — by substantial N. Y. State paving firm to handle heavy excavation and grading work. Must have C. E. degree and at least 5 years field experience in supervisory capacity. This job requires only top-flight ability. To the right person this job should return an annual income of $25,000.00. Our personnel know of this ad. P-8572, Engineering News-Record.

When Answering
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to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

POSITIONS VACANT

Engineers—structural designers and draftsmen for bridges and highways. Permanent positions depending on ability. New York City location. State qualifications, age, salary, and availability. P-8718, Engineering News-Record.

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Estimator-Construction, Expd. Public & private work, pricing & quantities. Est. firm. Salary open. Send complete resume. P-8696, Engineering News-Record.

EMPLOYMENT AGENCIES

Wanted Engineers, Designers, Draftsmen-Structural, Architectural, M.E., C.E., E.E. and Ind., also Teachers and Chemists, Cleveland Engineering Agency, 2132 E. 9, Cleveland.

POSITIONS WANTED

Available immediately construction engineer (Electrical) for overseas 44, single, 6 years experience design and inspection heavy construction and buildings. PW-8594, Engineering News-Record.

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Construction Engineer (Civil)—Registered, Illinois and Wisconsin, 6 years experience heavy sewer, bridge and building construction. Location open. Available January 1st. PW-8668, Engineering News-Record.

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Construction Supervisor — Civil Engineer, BSCE, age 29, 5½ years of supervisory experience in heavy construction including planning, supervision of structural work, and equipment installation. Must locate permanently within approximately 100 miles radius of Baltimore, Md. Resume on request. PW-8676, Engineering News-Record.

Highway engr. ten years abroad seeks foreign assignment. Address PW-8685, Engineering News-Record.

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Sewer and Water Pipe Foreman—Supt. or labor supt.—20 yrs. Constg. experience—Available immediately. PW-8715, Engineering News-Record.

Supt. or General Foreman—Age 41—over 20 years heavy constructural experience. Excavation grading, drainage and paving. Know men, methods, equipment & cost. Available after Jan. 1st. A-1 references. PW-8714, Engineering News-Record.

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P8673, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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P-8418, Engineering News-Record
330 W. 42nd Street, New York 36, N. Y.

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505 PARK AVENUE, NEW YORK 22, N. Y.

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P-8711, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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P-8701, Engineering News Record
520 N. Michigan Ave., Chicago 11, Illinois.

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P-8625, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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P-8534, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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P8632 Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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P-8704, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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P8675 Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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P-8672, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)
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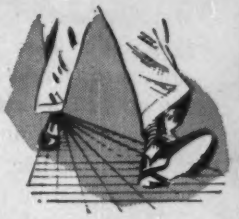

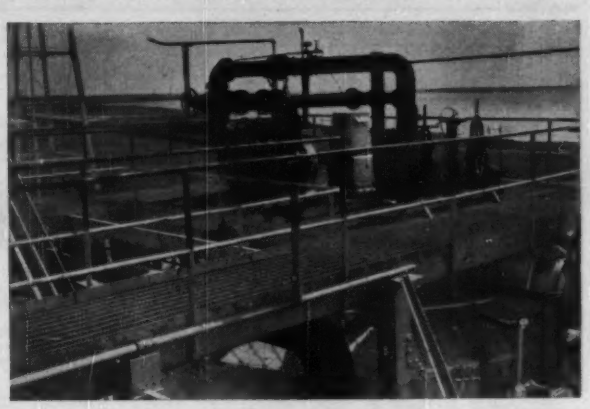

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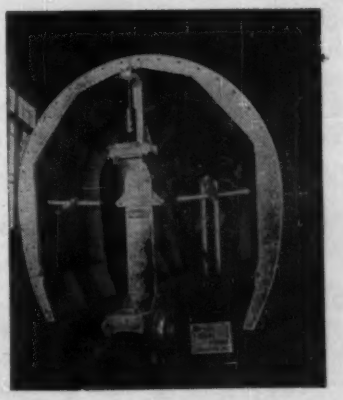

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Editorials

EJC Scores on Unity

ENGINEERS JOINT COUNCIL CAME A LONG WAY last week toward being recognized by engineers as the unity organization of their profession. It effectively coordinated the efforts of its ten component societies and 16 other engineering and scientific groups to stage a five-day Nuclear Engineering and Science Congress, plus an International Atomic Exposition, in Cleveland, Ohio (see p. 13). More than a year ago EJC saw a real opportunity, and grasped it, to assume the role of professional leadership on which its hopes have long been focused. It followed through by making a real success of a major undertaking.

The nuclear field was a natural, cutting completely across all present divisions of engineering interest. Never had there been such a chance to serve, and EJC went all out. There is some measure of the meeting's success in the fact that some 2,500 registered to hear a program of 250 papers and see the displays of over 150 exhibitors. But there is no real measure immediately applicable to the eventual good that will come of having pulled together all engineers interested to hear and discuss all important engineering information so far available in the nuclear field.

Nevertheless, this congress in Cleveland has developed a body of knowledge from which nuclear engineering in the U. S. will progress, aided by contributions from engineers in every division of the profession. Engineers Joint Council in coordinating the congress has played well the role of a unity organization and served ably a real need of the nation's engineering profession.

When Are Standard Designs Cheaper?

IN THE INVESTIGATION OF FAILURE of an Air Force rigid-frame warehouse (ENR Nov. 10, p. 10), one phase that has not been given much emphasis is the extent of "site adaptation" of the design that has been necessary. It is a fact that the Corps of Engineers had each district having jurisdiction for one or more of these warehouses re-analyze each design. In some cases, modification of the standard design was undoubtedly nominal. But in others, changes made necessary by local soil, climatic and seismic conditions resulted in almost complete redesign of the structure.

The need for substantial revisions raises the question as to whether standard designs for buildings might be doubtful economy in many instances.

Each of the armed services has made widespread use of "standard" plans in defense construction for warehouses, barracks, hangars and messhalls. These designs often turned out to be far from standard because major design changes had to be made to suit site requirements. Also, changes frequently were made at the suggestion of contractors to suit local construction conditions better. And in still further cases, field supervision has suffered because local staffs do not understand—and cannot easily find out—reasons for performing construction operations in a prescribed manner. Such uncertainties might be avoided if local designers—either staff or outside consultants—were more intimately involved in detailed planning.

There are other places besides defense construction where standard plans may not be advantageous. State legislatures are approached regularly with the suggestion that a state group or some other super-agency prepare standard plans for schools. One of the major shortcomings of such a proposal—aside from the obvious one of poor adaptation to different sites—is that local districts have different requirements in school plants. Even more important is the fact that design cost is really a minor factor; the type and nature of installed equipment can make school costs vary over an extremely wide range.

This same argument can be applied to defense construction, too. With design cost a small part of the total cost, savings in design fees might be false economy.

Standard plans have a definite place in our construction economy. But they should be used only where there is a real and demonstrable advantage.

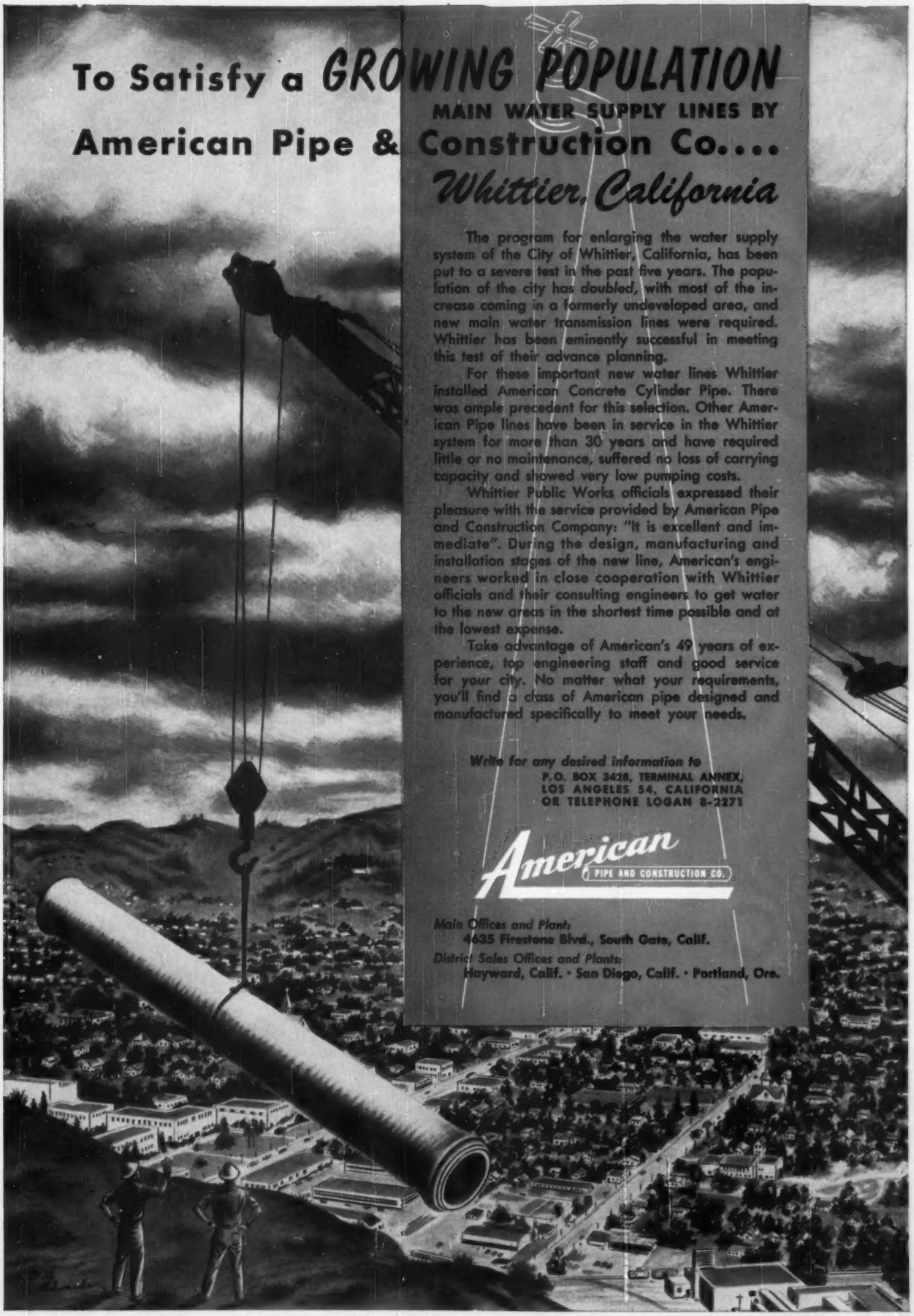
Contract Delay Penalties

THE CALIFORNIA HIGHWAY DEPARTMENT has taken a realistic position in assessing contract overrun penalties that include an evaluation of cost to highway users of traffic delays and congestion (see p. 16). Such increased assessments are bound to help keep vitally needed highway improvements more nearly on schedule. This helps the motor vehicle operator. It also permits more efficient planning and scheduling of new work.

The penalties are aimed at those few contractors who are habitually overtime. And it is intended to assure that bidders are fully equipped for efficient and swift work.

Whether the increased assessments will result in substantial increases in bid levels is hard to evaluate or predict. Working against such increases is the fact that contractors will not be penalized for weather or labor delays, and, in addition, the competitive nature of highway bids should be a further brake on higher costs. In total, if the new assessment policy is soundly administered, the long range effect cannot help but be beneficial to all concerned—highway users, well organized contractors and the highway department.

Improved highways are badly needed as quickly as possible. Soundly conceived assessment figures that include consideration of highway user costs are bound to encourage prompt completions. And this should have a salutary effect on prosecution of increased highway programs.



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"POWERSTEEL" cuts rope replacement costs on shovels and draglines saving time and manpower.

1" Yellow Strand "POWERSTEEL" Wire Rope stretched across the runway at Lambert Field, St. Louis brings the Banshee fighter to a safe, sure stop.

■ You may never have to lasso a 600 MPH jet —but if you have an application requiring an extra margin of strength, it's a cinch for Yellow Strand "POWERSTEEL"!

Made of higher carbon content steel, new "POWERSTEEL" is 15% stronger, assuring longer life. It withstands shock, resists wear. Preformed, with IWRC, "POWERSTEEL" is a heavy-duty, crush-resistant rope designed to give long, dependable service.

See your Broderick & Bascom distributor or write the branch nearest you for information.

Yellow Strand®

BRODERICK & BASCOM ROPE CO.

4203 Union Blvd. • St. Louis 15, Mo.

Manufacturers of Wire Rope for 79 Years

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